# 68. Shock Exposure Index (SEI) [NEW]

**68**

**N E W**

| | |
|---|---|
| **VERSION** | V1 – 2023.04 |
| **INDICATOR CODE** | 68 |
| **INDICATOR TYPE & AREA** | **Type:** Outcome corporate indicator (Positioned for the CRF)<br><br>Reported in ACR and APR<br><br>4. Livelihoods |
| **INCLUDED IN CSP LOGFRAMES** | Yes |
| **APPLICABILITY** | **Mandatory (if relevant):**<br><br>Under any relevant SO if WFP is implementing resilience building programmes (for programmes using the Integrated Resilience Programme thematic marker).<br><br>**Recommended:**<br><br>Under any SO if the programmes/CSP activities contribute to the building of household capacity to manage shocks and stressors.<br><br>**This indicator is particularly relevant for multi-year interventions (with panel sampling).** |
| **TECHNICAL OWNER** | Livelihoods, Asset Creation and Resilience (PROR-L) |
| **ACTIVITY TAGS** | *Food Assistance for Assets (FFA)<br><br>*Food Assistance for Training (FFT)<br><br>*Smallholder agricultural market support Activities (SMS)<br><br>*Other climate adaptation and risk management activities (CAR)<br><br>*Nutrition (NUT)<br><br>*School feeding (on-site) (SF_ONS)<br><br>*School feeding (take-home rations) (SF_THR, SP) |
| **UNIT OF MEASUREMENT & ANALYSIS** | Score – Household level |
| **DEFINITION** | The shock exposure index (SEI) measures the overall degree of shock and/or stressor exposure for each household adapted from the TANGO method.[23]<br><br>**Shocks** are short-term events or deviations, such as a drought, an earthquake or armed conflict. When combined with pre-existing vulnerabilities, a shock can lead to crises with substantial negative effects on people's current state of wellbeing, level of assets, livelihoods, safety, or ability to withstand future shocks. |

---

[23] TANGO (2018) methodology is available online here: https://www.fsnnetwork.org/sites/default/files/Methodology_Guide_Nov2018508.pdf

**Stressors** can be seen as long-term trends or pressures that undermine the stability of a system and increase vulnerability within it. Examples of trends include population, resource, economic, governance and technological trends. Stressors can also be seen as threatening conditions that have a slower onset. They include conditions such as low water quality, poor sanitation, environmental degradation, and challenging household structures (e.g. high dependency ratios). Stressors can be seasonal, such as the seasonality of prices, production, health and employment opportunities.

**Exposure** refers to the frequency and intensity of shocks and/or stressors. As adverse effects of these broad categories can vary between households and communities, capturing this variability is important for the monitoring and programming of resilience interventions.

The index calculates exposure based on household data regarding:

- Number of shocks to which a household has been exposed in the past 12 months (out of six total shocks collected).
- Perceived severity of each shock in terms of impact on food consumption and income.

| | |
|---|---|
| **RATIONALE** | As aligned to the resilience monitoring and measurement (RMM) approach[24], an important component of resilience programming and evidence generation is the ability to describe the typology and severity of shock events. The underlying principle of the SEI is to provide a comprehensive score for household-level exposure to and severity of shocks. By gathering data on a range of six covariate and idiosyncratic shocks, it can support programme adjustments by providing information on their frequency and severity. The SEI can support the interpretation of outcome data, such as coping strategies, food consumption or nutrition. |
| **DATA SOURCE** | The main data sources for this indicator are face-to-face and/or remote baseline and outcome monitoring surveys (e.g., post-distribution monitoring or PDM) conducted at the household level collected from the main participant of WFP activities in the household. |
| **DATA COLLECTION TOOL** | The SEI is collected through the following module (adapted from Module R1 of the TANGO method[25]). For consistency, the same six (6) shocks should be collected, year-on-year for comparability. However, if the types of shocks and stressors experienced has changed significantly (e.g. due to a new unanticipated shock such as conflict or market failure) as informed by complementary evidence, the shocks and stressors in the indicator statements will require updating.

The types of shocks referenced in the indicator statements requires tailoring to each context within the country (e.g. urban or rural, agricultural or pastoralist). For instance, certain shocks listed below may not be relevant to all contexts (e.g., hail/frost, cyclones). Secondary sources (such as the Community Based Participatory Approach (CBPP), Seasonal Livelihood Programming (SLP) and Integrated Context Analysis (ICA) – Three Pronged Approach (3PA) or national data) or qualitative research can inform the selection of six shocks across various categories. |

| Context-specific shocks | Did your household experience [the shock] within the last year (12 months)?<br><br>**1 = Yes; 0 = No** | How severe was the impact of the shock on your household's food consumption and income over the last 12 months?<br><br>**1 = No impact; 2 = Slight impact; 3 = Severe impact; 4 = Worst ever experienced** |
|---|---|---|

---

[24] Guidance available here: https://newgo.wfp.org/collection/resilience-draft-toolkit
[25] The survey module is available in the WFP Survey Designer: https://www.surveydesigner.vam.wfp.org/design/survey

| | | |
|---|---|---|
| 1.  Shock A | | |
| 2.  Shock B | | |
| 3.  Shock C | | |
| 4.  Shock D | | |
| 5.  Shock E | | |
| 6.  Shock F | | |

A list of shocks (and/or stressors) appear which may be applicable for collection in this index appear below:

| Shock/Stressor Choices | | |
|---|---|---|
| Excessive rain or flooding | Insufficient rain, dry spells or drought | Unpredictable rainfall |
| Cyclone, storm or hail storm | Heavy snowfall or avalanches | Hot spell or heatwave |
| Strong winds or sand storm | Wild fires | Landslide or rockfall |
| Volcanic eruption/disruption due to volcanic activity | High food prices or food price spikes | Increased costs of agricultural inputs, livelihood inputs, fuel or rent |
| Electricity cuts or blackouts | Water supply shortages | A decrease in the amount of money received through remittances/reduced remittances |
| Unemployment or lack of wage/livelihood opportunities | Low prices when selling agricultural or livestock products | Decreased in daily wage labour rates |
| Times when it is not safe to leave your house or to access your livelihoods | Armed conflict, gang violence or ethnic clashes | Political instability or civil unrest |
| Movement restriction e.g. at checkpoints, curfew and lockdown | Displacement or forced movement | Gender discrimination or harassment |
| Discrimination or harassment e.g. on the basis of ethnicity or refugee status | Cattle or livestock raiding | Livestock disease, injury or death |
| Illness, injury or death in the household | Loss of farming or grazing land | Theft or robbery |
| Loss of home or rental property | Delays or cuts in humanitarian assistance | |

# 4. RESILIENCE & LIVELIHOODS

| | |
|---|---|
| **SAMPLING REQUIREMENTS** | As the SEI will be administered in PDMs or other monitoring surveys, the sampling requirements will align with these surveys.<br><br>To the extent possible, sampling should include an equal number of men and women respondents, be representative of WFP's activities that aim to build resilience and ideally follow the same respondents over time (that is, panel data). This will facilitate analysis of the impacts of individual programs and of shocks on household well-being outcomes, such as their resilience.<br><br>Panel sampling and the use of comparison groups are recommended for this indicator to facilitate a comprehensive analysis of the effect of shocks on food consumption and/or wellbeing.<br><br>Detailed guidance on sampling is available here. |
| **INDICATOR CALCULATION** | The index is calculated by considering:<br><br>• Number of shocks/stressors to which a household is exposed to where the variable equals to a value of 1 if the shock was experienced and a value of 0 if not experienced.<br><br>    o As referenced in the tool above, the standard module contains 6 shocks/stressors – if the module is adapted to a specific country context and the total number of shocks/stressors is changed this must be referenced in the calculation.<br><br>• Perceived severity of the shocks using one variable: impact on food consumption and income<br><br>    o As referenced in the tool above, perceived severity is measured on a 4-point scale [1 = No impact; 2 = Slight impact; 3 = Severe impact; 4 = Worst ever happened].<br><br>• The index itself is a weighted average of the incidence of experience of each variable weighted by the perceived severity of the shock ranging from 0 [i.e., $0_{\text{No exposure}} * 1_{\text{No impact}}$] to 24 [i.e., $6_{\text{Maximum exposure}} * 4_{\text{Maximum severity}}$]. This weighted average is expressed in the formula below: |

Shock Index = $(Y1*Z1)$ + … $(Y6*Z6)$; where Y = Incidence of the shock multiplied by Z = Perceived severity of the shock.

The shocks listed through variables X1 … X6 will depend on the survey module used within the country-specific context.

As an example, a survey module with completed responses and calculation is presented below:

| Context-specific shocks | Did your household experience [the shock] within the last year (12 months)?<br><br>**1 = Yes; 0 = No** | How severe was the impact of the shock on your household's food consumption and income over the last 12 months?<br><br>**1 = No impact; 2 = Slight impact; 3 = Severe impact; 4 = Worst ever experienced** |
|---|---|---|
| Excessive rain | 1 | 3 |
| Reduced remittances | 0 | 1 |
| High food prices | 1 | 4 |

| Theft or robbery | 1 | 2 |
|---|---|---|
| Electricity cuts or blackouts | 1 | 1 |
| Wildfires | 0 | 1 |

Shock Index = (Incidence$_{Excessive\ rain}$ + Severity$_{Excessive\ Rain}$) ... (Incidence$_{Wildfires}$ + Severity$_{Wildfires}$)

Shock Index = (1*3) + (0*1) + (1*4) + (1*2) + (1*1) + (0*1)

Shock Index = 10

The SPSS syntax is available *here: [GitHub Indicator Repository](#)*

| | |
|---|---|
| **DATA ENTRY IN COMET** | Data from this indicator will be entered into the CSP Logframe in COMET |
| **DISAGGREGATION FOR ENTRY IN COMET (MANDATORY)** | **Mandatory**:<br><br>• Sex of household head<br><br>**Optional**:<br><br>• Location<br>• Target Group<br>• Activity Type<br><br>Further disaggregation of this indicator can support the analysis of resilience programme outcome data. For instance, disaggregation of the SEI by the terciles of the [resilience capacity score](#) (Low, Medium, High) may provide greater information on these outcomes. Disaggregation could also be by the terciles of the food consumption score or categories of the coping strategies index. |
| **FREQUENCY FOR DATA COLLECTION** | Bi-annual collection is recommended to understand the changing shock context and level of shock exposure for participating households. If seasonal shocks occur, collection of the index after these events is advised to facilitate analysis with food security and/or wellbeing outcome data. |
| **BASELINE ESTABLISHMENT** | N/A |
| **TARGET SETTING** | N/A |
| **RESPONSIBLE FOR DATA COLLECTION** | Monitoring Officer, VAM Officer and/or implementing partners |
| **INDICATORS COLLECTED & ANALYSED AT THE SAME TIME** | Food Consumption Score (FCS), Consumption-based Coping Strategies Index (rCSI), Livelihood Coping Strategies Index – Food Security (LCSI), Resilience Capacity Score (RCS) |

# 4. RESILIENCE & LIVELIHOODS

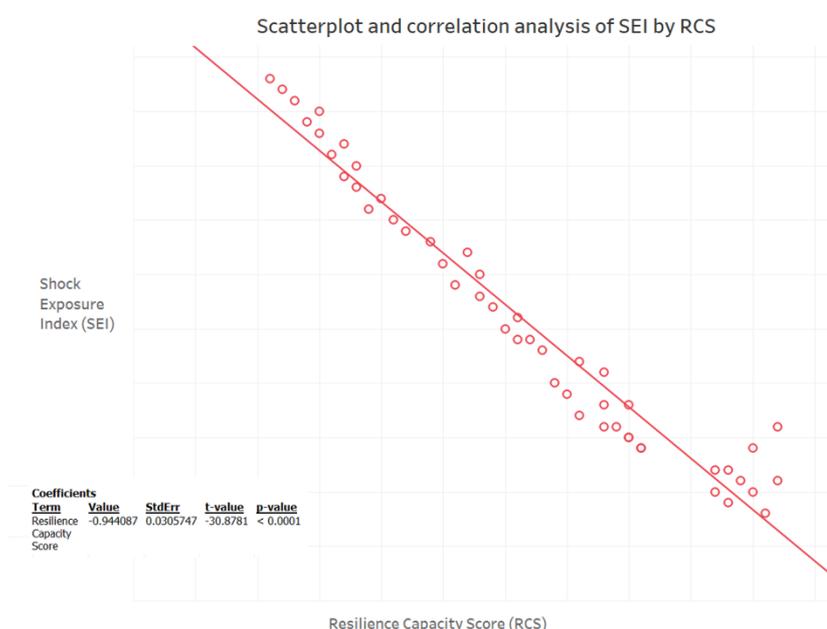| | |
|---|---|
| **COMPLEMENTARY QUALITATIVE RESEARCH** | Complementing this indicator with qualitative data collection is highly recommended. Following analysis of the indicator data, focus group discussions (FGD) or qualitative interviews can be carried out to better understand communities' perceptions of the local shock and stressor context. This may include shock and stressor frequency, predictability, scale, interaction, and trends. A guide for collecting qualitative data to complement this indicator is available in as a module of the RCS qualitative guide. The questions can be adapted to the country context and information needs. |
| **DECISIONS DATA CAN INFORM** | The index can be used to inform resilience programming, by providing more detail on the typology and severity of shocks that project participants experience. Analysis of the index may also be used to help interpret programme results and to effectively explain the project context. |
| **INTERPRETATION** | **Step 1: Interpret the overall SEI score** |

The higher the SEI, the greater the degree of shock exposure for surveyed households with households indicating a greater severity of impact on their income and food consumption. As the overall score is measured on a numerical scale, it is recommended that further inferential analysis to be done with the SEI (e.g. correlation, linear regression) to test associations with other outcome data. Specifically, statistical testing on whether higher shock exposure is associated with differential outcomes on income, food consumption and/or wellbeing (i.e. FCS, RCS, rCSI) are recommended. For example, the visualization below using constructed data shows the scatterplot and correlation co-efficient between the SEI and RCS. From this, we are able to see that higher shock exposure is associated with lower perceptions of resilience capacity.



Scatterplot and correlation analysis of SEI by RCS

| Coefficients | | | | |
|---|---|---|---|---|
| **Term** | **Value** | **StdErr** | **t-value** | **p-value** |
| Resilience Capacity Score | -0.944087 | 0.0305747 | -30.8781 | < 0.0001 |

**Step 2: Interpret the SEI components**

Analysis of individual shocks could include frequencies (count data) of shock incidence as well as the mean (average) of the perceived severity variable used to calculate the composite score. This step would facilitate analysing the individual impact of each shock collected and their attached severity – allowing a more detailed understanding of the effects of specific shocks in context. For example, the visualization below using constructed data shows the severity of different shocks.

## SEI: Average Severity
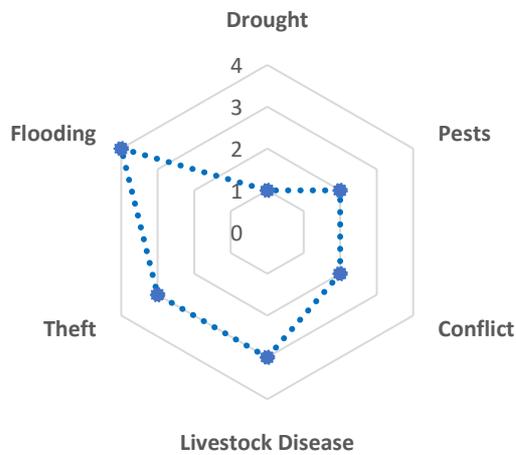


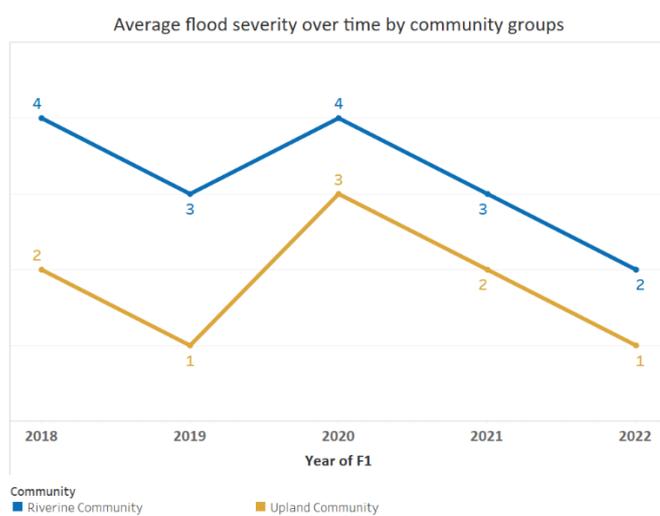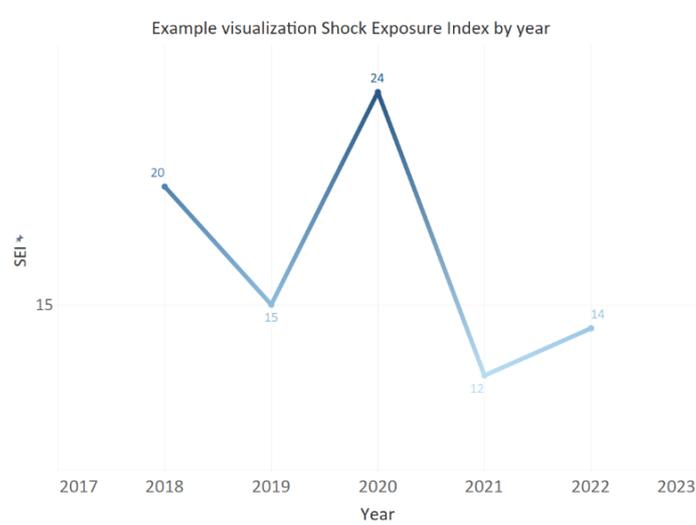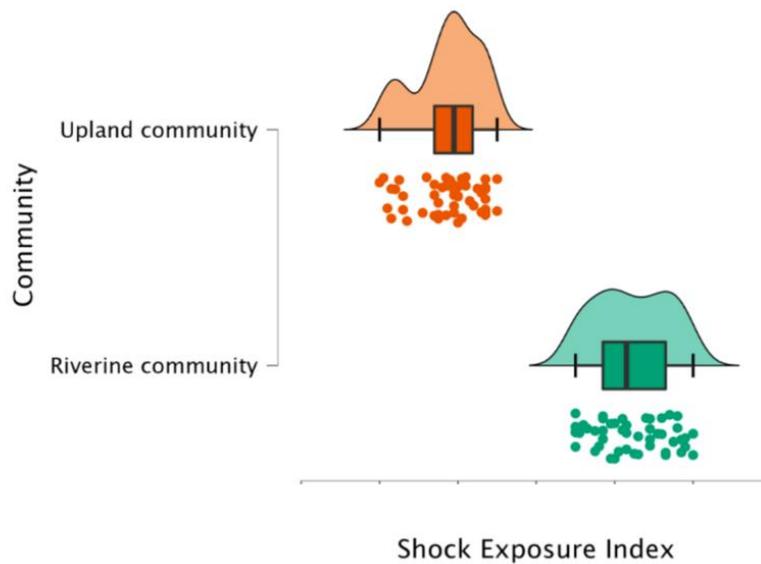| REPORTING EXAMPLE(S) | Reporting on the index following an outcome monitoring exercise may include reference to the average scores, the frequency of different shocks and the severity of different shocks over time such as the below: |
|---|---|
| | The relative shock exposure of households was high (with an average score of 18). When disaggregated by sub-group, participants of the livelihood's intervention had higher shock exposure scores (M = 22) compared to those not participating (M = 16). When analysing the frequency of shocks experienced, households reported price spikes, currency crisis and debt crisis as the shocks they were most frequently exposed to. However, substantially more households in the livelihood group experienced pests, parasites or crop disease comparatively which may explain the difference in average scores. Further to this, analysing the severity rating of these four shocks provides further insight into the level of exposure with all participants rating the economic shocks (Price Spikes, Currency Crisis and Debt Crisis) as more severe than agricultural shocks. |

| VISUALIZATION | Single-round data collection can be visualized by disaggregation dimensions below using bar graphs, line graphs, density plots or other summative visualizations (as exampled below using constructed data). |
|---|---|



Example Visualization Shock Exposure Index by Area
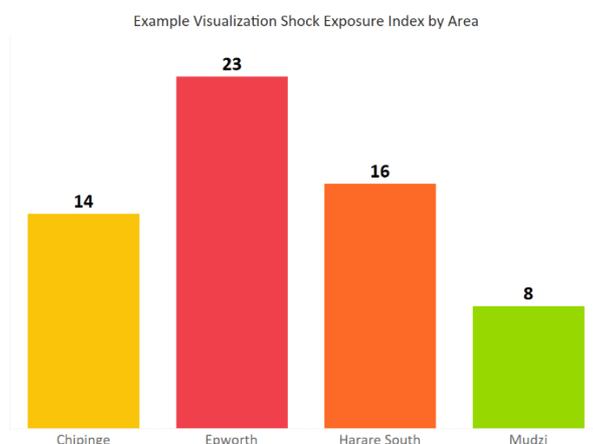
Multiple rounds of data can be visualized by population groups, breakdowns over time and or both of these data points (as exampled below using constructed data).

# 4. RESILIENCE & LIVELIHOODS



Shock Exposure Index



Example visualization Shock Exposure Index by year



Average flood severity over time by community groups

| LIMITATIONS | The index provides information on households' exposure to six shocks and/or stressors included in the question module. Given this, the articulation of these six shocks and stressors needs to be informed by secondary data or qualitative research to understand the main shock and stressors experienced by target households. The inclusion of irrelevant shocks and/or stressors would provide misleading information on the extent to which interviewed households are exposed shocks and stressors. The index also does not speak to interactions between different shocks and stressors, which could be analysed insight of complementary evidence sources and qualitative research. |
|---|---|
| FURTHER INFORMATION | For further reading, consult: |

For further reading, consult:

- The TANGO full [methodological guide](#)

- Practical example from Smith, Frankenberger, & Nelson 2018 [Feed the Future Ethiopia Pastoralist Areas Resilience Improvement and Market Expansion (PRIME) Project Impact Evaluation: Report of Recurrent Monitoring Survey 2 (2015/16)](#)

**For further information and support please contact PROR-L unit:**
[wfp.resilience@wfp.org](mailto:wfp.resilience@wfp.org)