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CLIMATE IMPACT RESEARCH

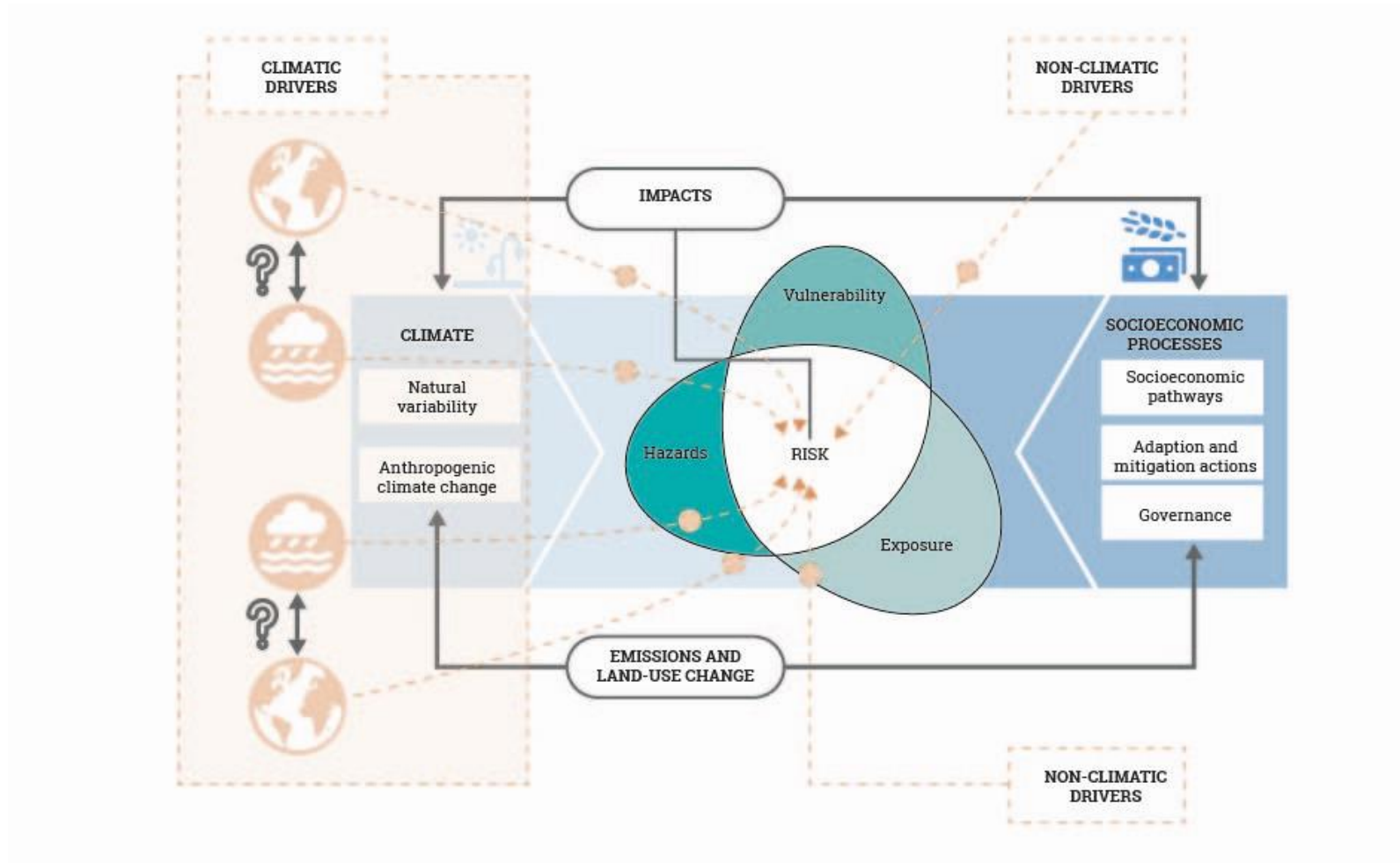
Systemic risk and compound vulnerability in the food system: a Somalia case study

Safe Landing Climates Discussion Series: Cascading Risks for Food Production

November 20, 2023

Dr. Franziska Gaupp

Compound events

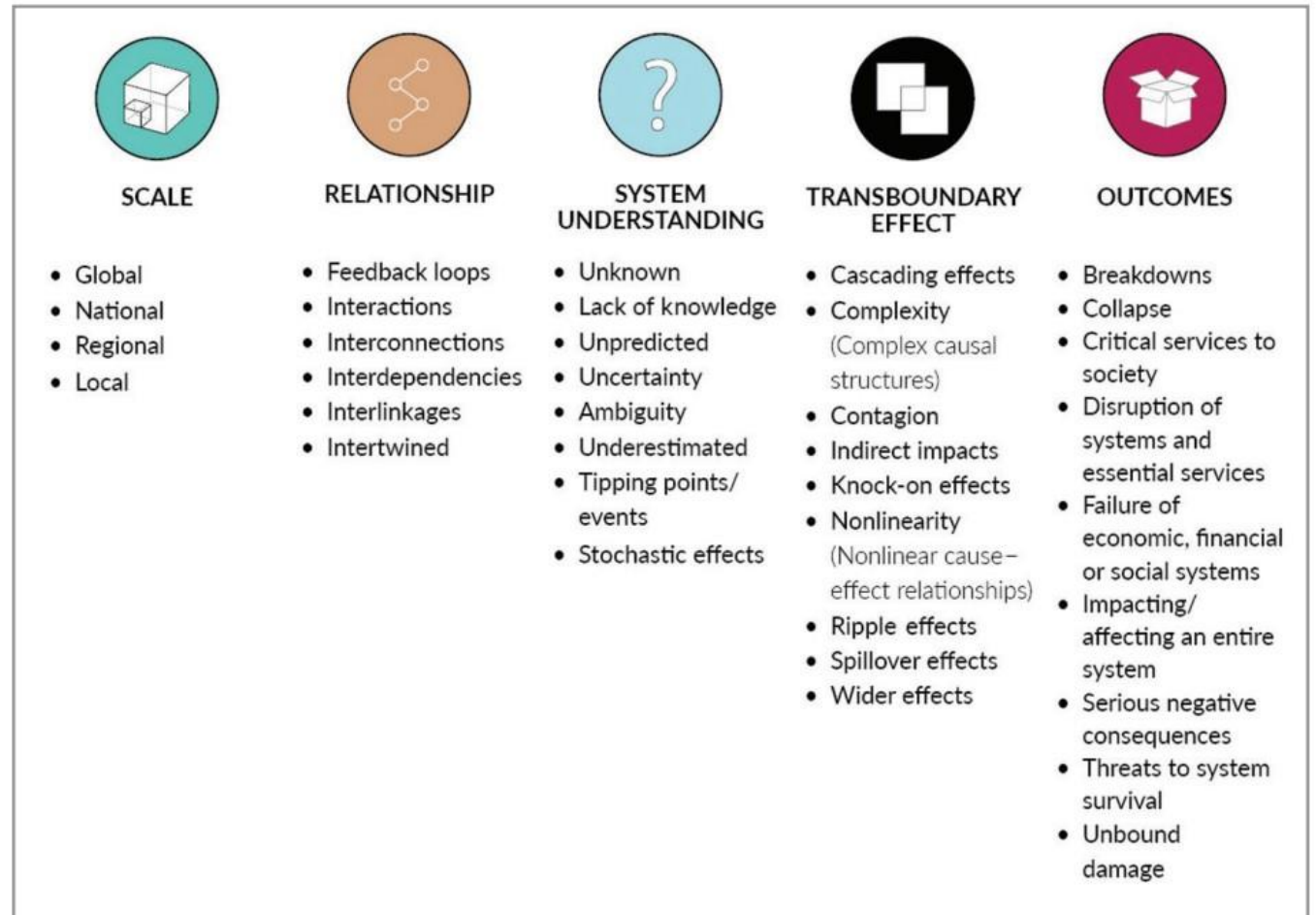


GAR22, based on Zscheischler 2018 and IPCC AR5

Systemic Risks

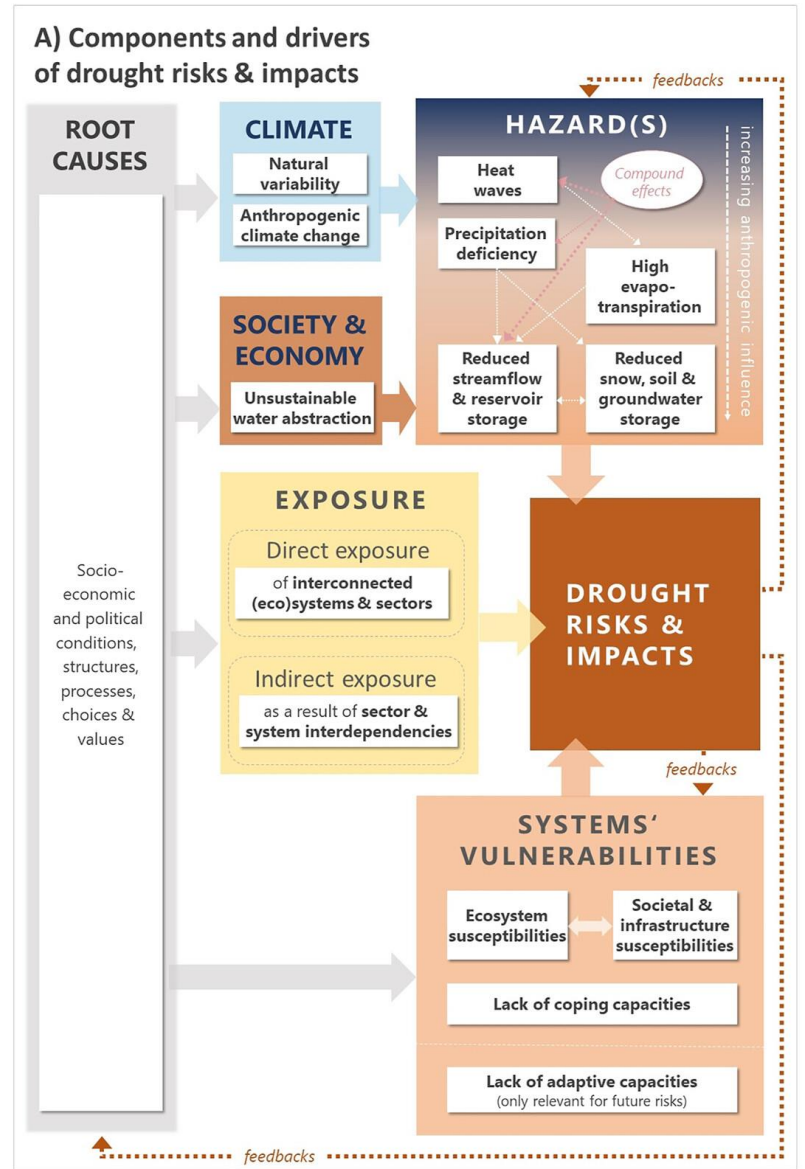
Systemic risk is endogenous to, or embedded in, a system that is not itself considered to be a risk and is therefore not generally tracked or managed, but which is understood through systems analysis to have a **latent or cumulative risk potential to negatively impact overall system performance** when some characteristics of the system change.

UNDRR, 2019



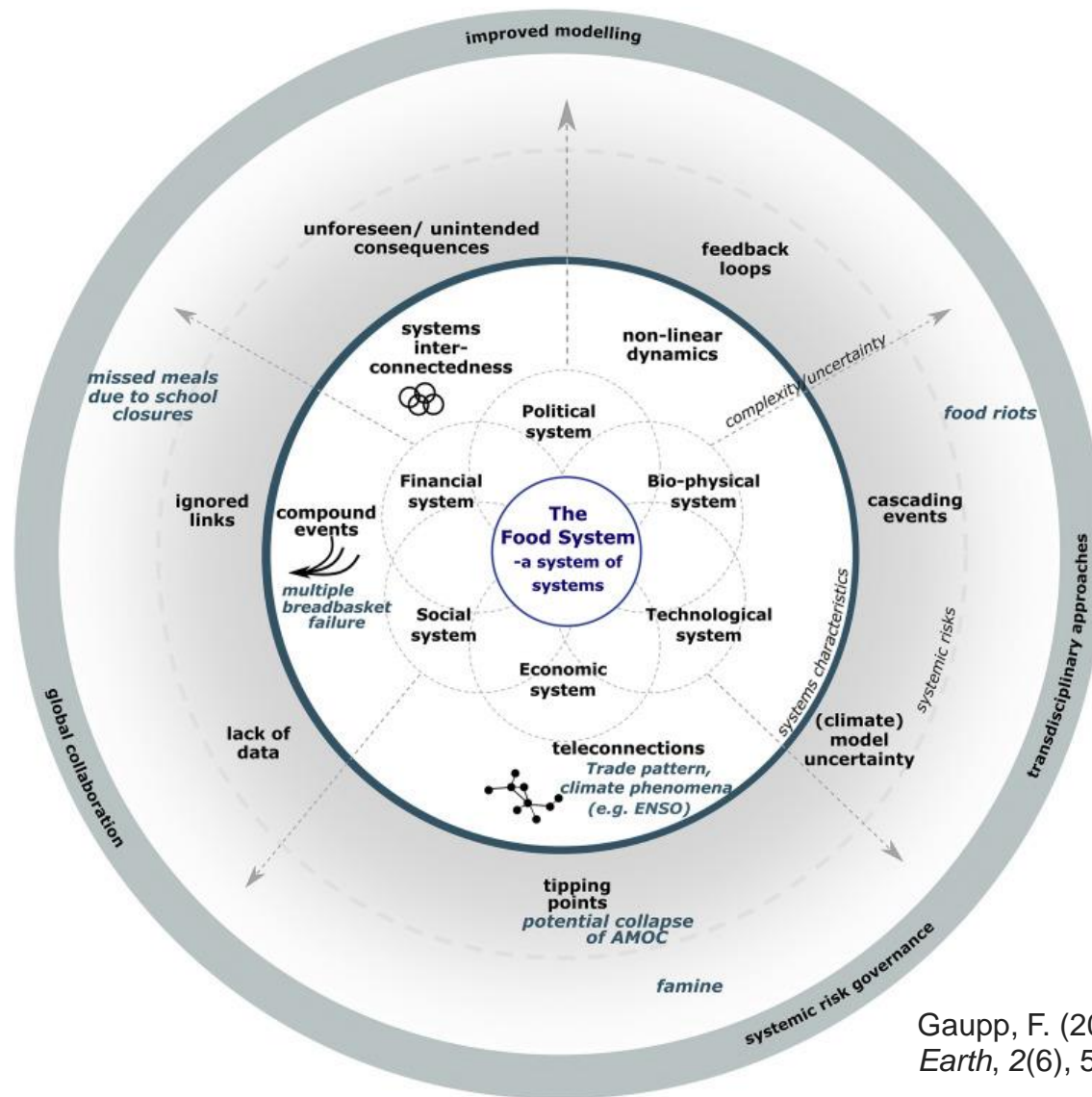
Sillmann, J., I. Christensen, S. Hochrainer-Stigler, J. Huang-Lachmann, S. Juhola, K. Kornhuber, M. Mahecha et al. "Systemic Risk." *Briefing Note on Systemic Risk* ISC-UNDRR-RISK KAN (2022).

Systemic nature of drought risk



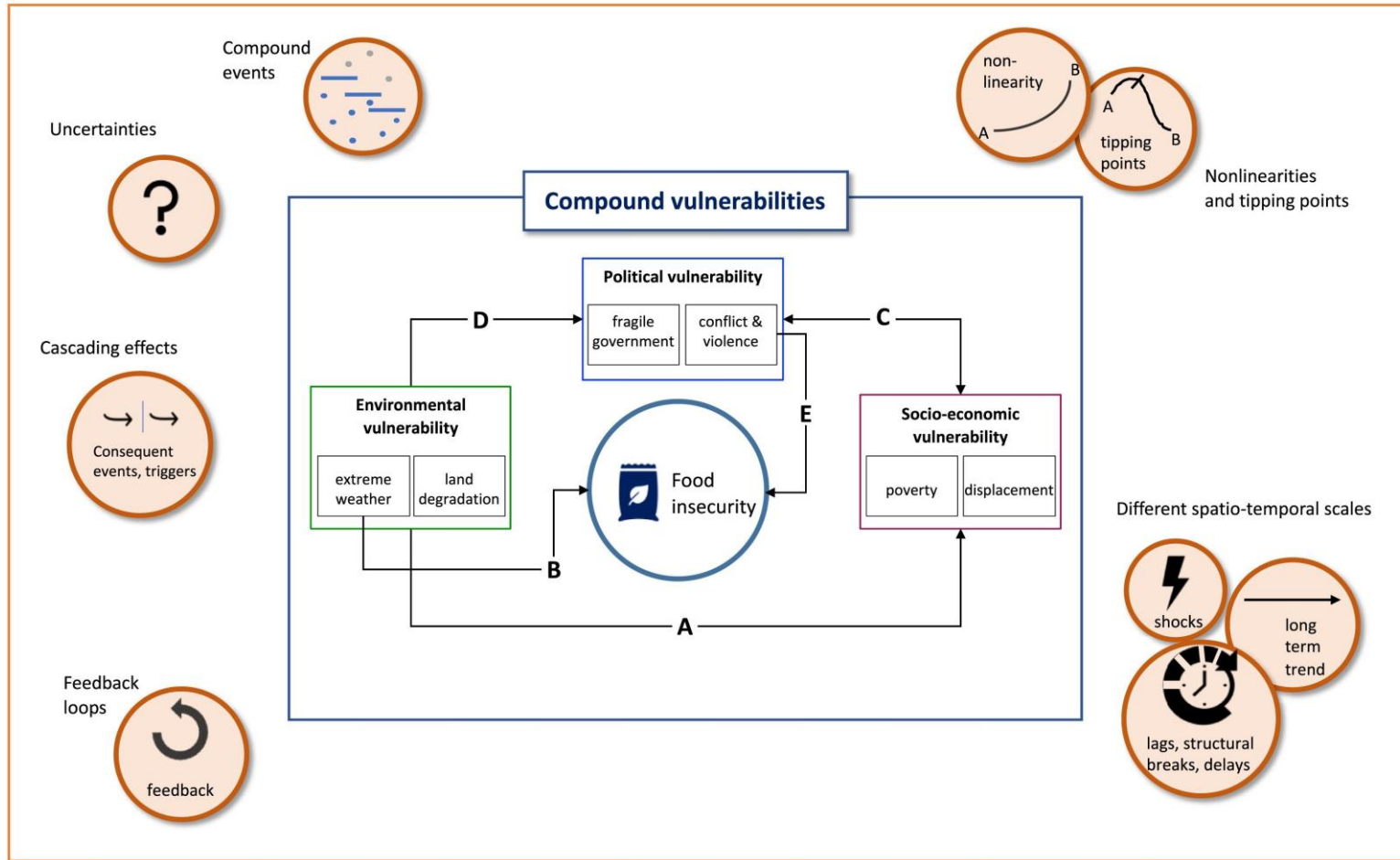
Hagenlocher M, Naumann G, Meza I, Blauhut V, Cotti D, Döll P, Ehlert K, Gaupp F, Van Loon AF, Marengo JA, Rossi L. Tackling growing drought risks—the need for a systemic perspective. *Earth's Future*. 2023 Sep;11(9):e2023EF003857.

Systemic risks in the global food system



Gaupp, F. (2020). Extreme events in a globalized food system. *One Earth*, 2(6), 518-521.

Systemic risks and compound vulnerabilities in Somalia



Compound vulnerability:

- Driven by an array of systemic and interdependent stressors (e.g. poverty, political instability, lack of coping capacities)
- Shaped by complexity of drivers (e.g. organisation of access to key resources, how institutions facilitate adaptation)
- Dynamic in terms of temporal and spatial scales

Thalheimer, L., Gaupp, F., & Webersik, C. (2023). Systemic risk and compound vulnerability impact pathways of food insecurity in Somalia. *Climate Risk Management*, 100570.

Somalia

- Since 1990s enduring armed internal conflict leading to a war economy giving rise to behavior of corruption, extortion and the control of humanitarian aid and thus the guarantee for food supply
 - myriad violent groups dominate the country (e.g. al-Shabaab) led to a well-established war economy
 - Recurring extreme weather events (e.g. 2011, 2020-23 drought) and absence of central government, coupled with poverty and civil conflict
-
- ➔ Crisis level food insecurity and large-scale displacement
 - ➔ Drought-reported displacement followed by flash floods in 2018
 - ➔ Food insecurity among top five humanitarian needs



Somalia

- livestock and crop production forming the backbone of its economic performance
- agriculture value-added as a percentage of total Gross domestic product (GDP) was 65.5% in 1990 and the GDP share remains above 60% in 2012
- Nomadic pastoralism with circular migration following rainfall patterns



Data

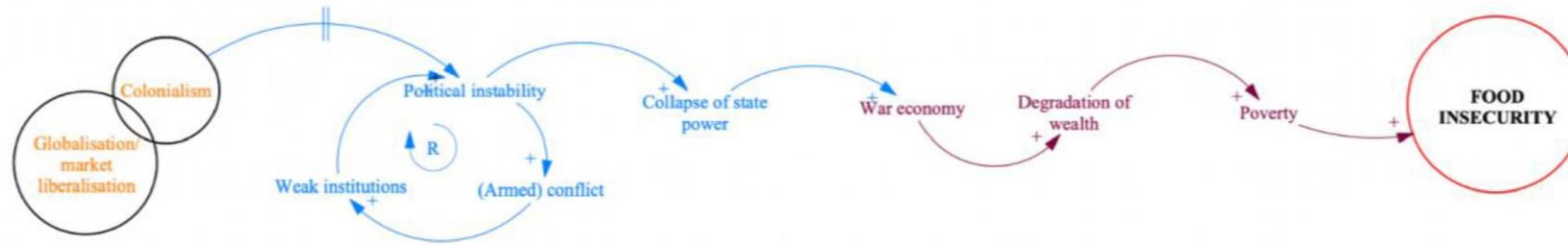
- Field surveys and expert consultations (WB 2018-2019), disaster statistics (EM-DAT 1983-2022), IDP priority needs data (UNHCR 2016-2019), literature review

Systemic Risk Impact Pathways (SRIP)

- Combine concepts of systemic risk drivers with causal linkages between vulnerabilities
- Characteristics:
- Purpose (demonstrate how systemic risk drivers exacerbate environmental, socioeconomic, and political vulnerabilities compound in Somalia and lead to food insecurity)
 - Model boundaries (Somalia)
 - Time horizon
 - Level of aggregation (national, surveys with 18 sub-regions)

SRIPs

a)



b)



Systemic risk management

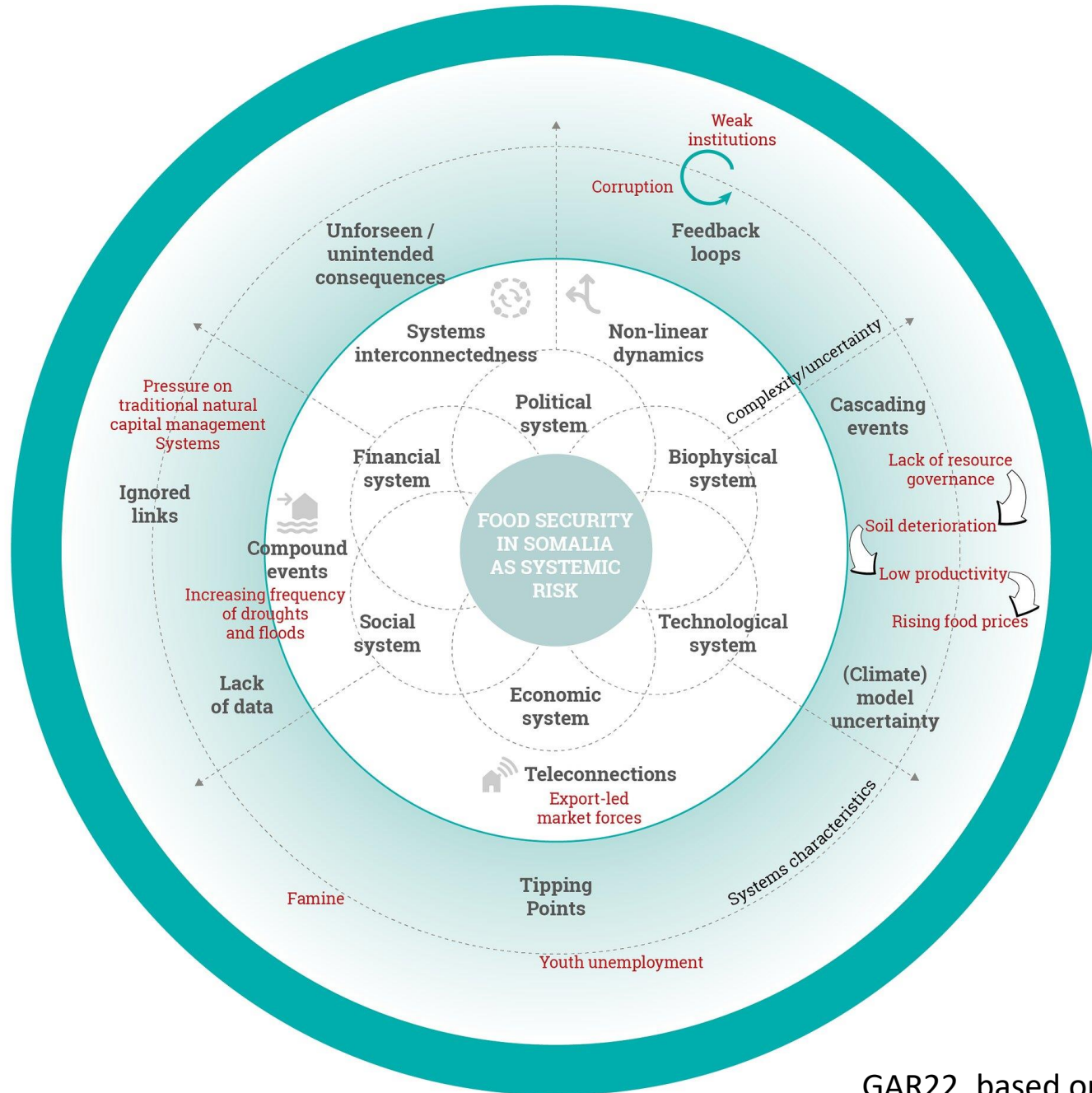
- **anticipatory humanitarian action** (e.g. forecast-based financing tools) present a suitable funding opportunity to reduce vulnerability
 - Example from Mongolia: provision of climate-resilient feeding, veterinary care, and water supply in pastoralist areas helps to prepare vulnerable populations
- building **systemic resilience** through social safety nets, e.g., small cash transfers and school feeding programs targeted to vulnerable and at-risk households
- Emergency crop and livestock asset protection

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GAR22, based on Thalheimer



Leibniz
Association

FSEC storylines

Systemic risk and compound vulnerability in the food system

