

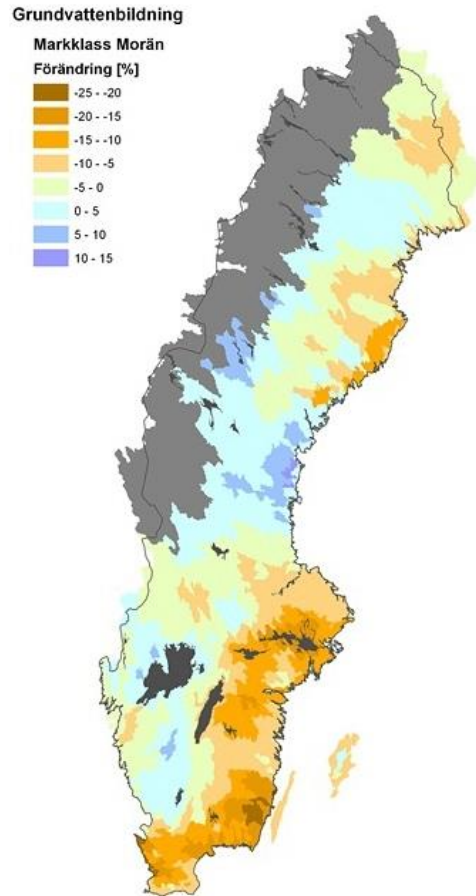
Governing Transnational Climate Risks in Sweden

Magnus Benzie
Stockholm Environment Institute

Indirect International Impacts of Climate Change workshop
Zurich, Tuesday 26th September 2017



Adaptation *within* Borders



*“The **global context receives fairly cursory treatment** in most of the national adaptation strategies studied. The focus instead is on dealing with the impacts of climate change and adaptation activities **within the borders** of the country.”*

Review of National Adaptation Strategies in Europe (PEER, 2009)

See also Benzie et al (2013) National Communications to the UNFCCC don't mention indirect impacts

Adaptation *without* Borders

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Adaptation without Borders - Indirect Impacts of Climate Change



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Contacts



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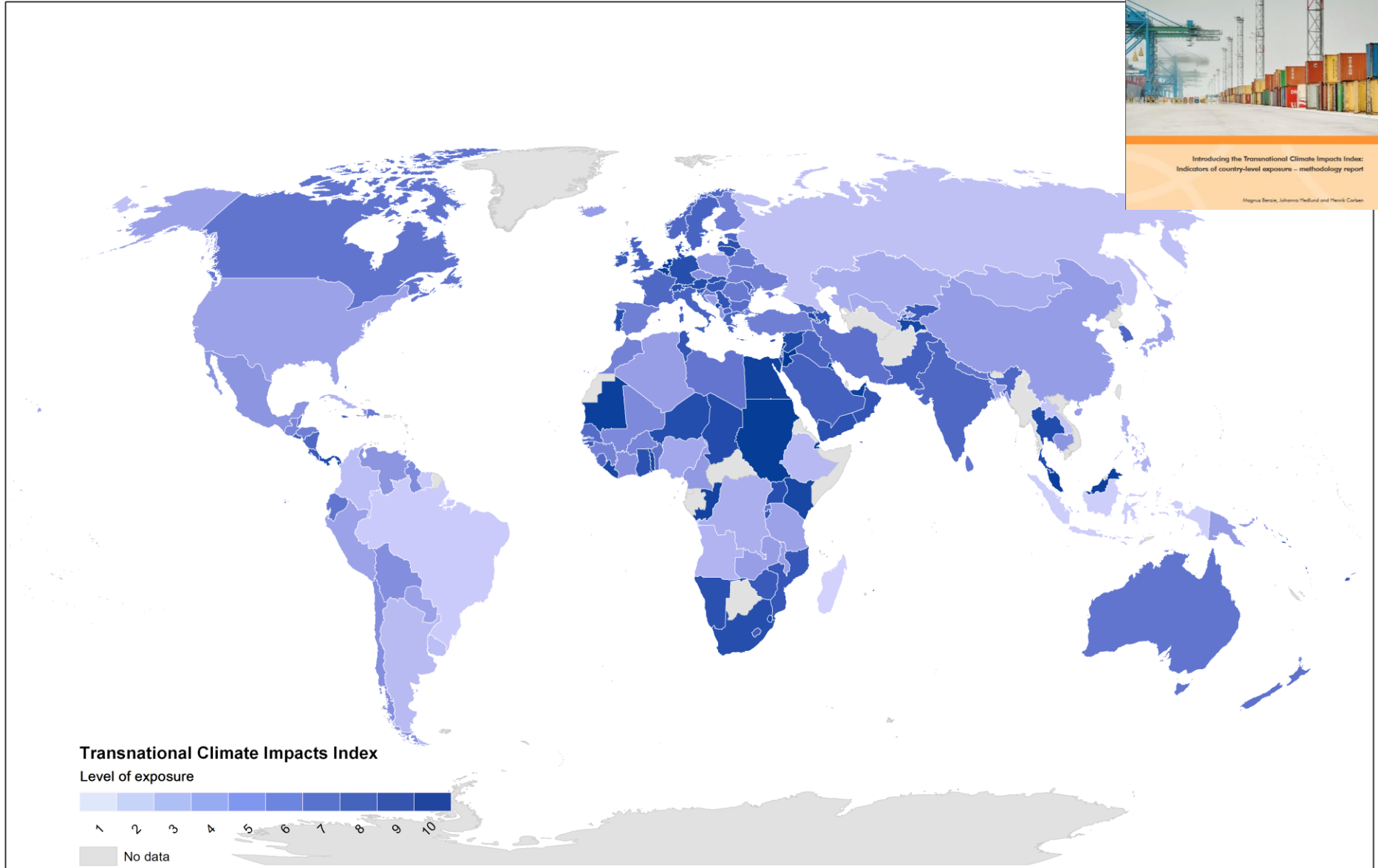
Henrik Carlsen
at Stockholm Environment Institute

Why is adaptation so territorial?

- IVA "Epistemic Community"
- Role of the nation state + UNFCCC process
- Complexity
- Adaptation overload

See: Benzie & Persson (2016) *Governing Borderless Climate Risks in a Bordered World*

TCI Index



ND-GAIN Index

rank	country	ND-GAIN	region
1	Somalia	0,619269	SSA
2	Burundi	0,589934	SSA
3	Sierra Leone	0,589454	SSA
4	Afghanistan	0,582659	MENA
5	Central African Republic	0,578745	SSA
6	Togo	0,575294	SSA
7	Liberia	0,574009	SSA
8	Democratic Republic of the Congo	0,571659	SSA
9	Ethiopia	0,547401	SSA
10	Guinea	0,545373	SSA
11	Mali	0,544416	SSA
12	Chad	0,544176	SSA
13	Solomon Islands	0,543934	SIDS
14	Madagascar	0,53886	SIDS
15	Haiti	0,536119	SIDS
16	United Republic of Tanzania	0,535535	SSA
17	Guinea-Bissau	0,535389	SSA
18	Timor-Leste	0,534922	SIDS
19	Burkina Faso	0,533261	SSA
20	Kenya	0,530445	SSA
21	Niger	0,529114	SSA
22	Yemen	0,527486	MENA
23	Sudan	0,526868	SSA
24	Uganda	0,521598	SSA
25	Rwanda	0,520746	SSA
26	Benin	0,517244	SSA
27	Angola	0,515639	SSA
28	Mozambique	0,513187	SSA
29	Cote d'Ivoire	0,502742	SSA
30	Nigeria	0,502678	SSA

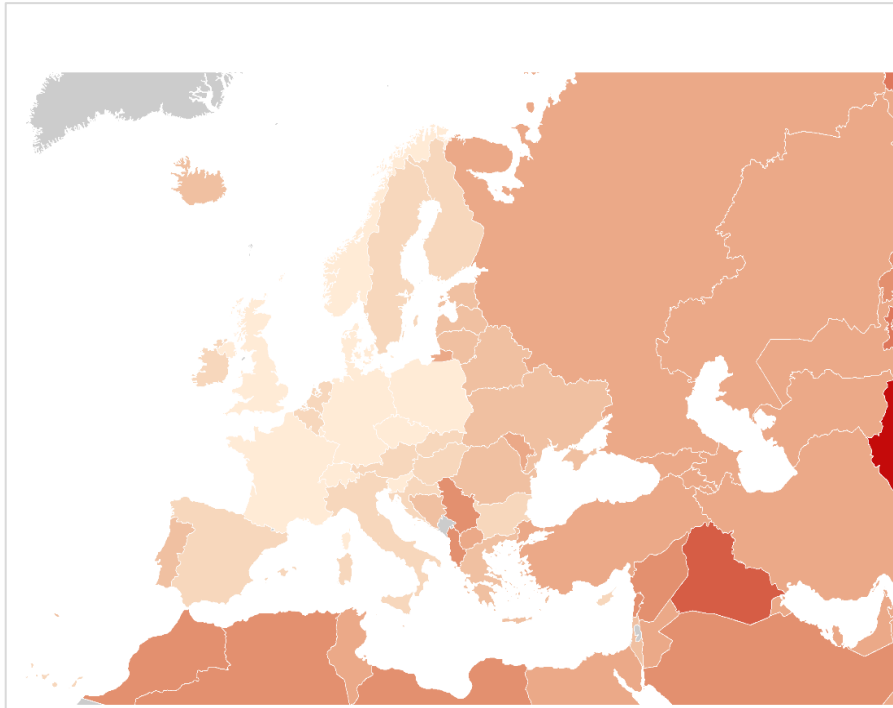
TCI Index

rank	country	TCI Index	region
1	Jordan	8,111111	MENA
2	Lebanon	7,857143	MENA
3	Kuwait	7,571429	MENA
4	United Arab Emirates	7,428571	MENA
5	Sudan	7,142857	SSA
6	Netherlands	7,111111	Eur
=7	Mauritania	7	SSA
=7	Belgium	7	Eur
=7	Luxembourg	7	Eur
10	Malaysia	6,888889	SE Asia
11	Egypt	6,777778	MENA
12	Gambia	6,75	SSA
13	Togo	6,625	SSA
=14	Tajikistan	6,555556	CE & C
=14	Swaziland	6,555556	SSA
16	Liberia	6,444444	SSA
=17	Portugal	6,333333	Eur
=17	Kenya	6,333333	SSA
=19	Maldives	6,285714	SIDS
=19	Montenegro	6,285714	Eur
21	Malta	6,25	Eur
=22	Armenia	6,222222	CE & C
=22	Thailand	6,222222	SE Asia
24	Latvia	6,125	Eur
25	Fiji	6,111111	SIDS
=26	Azerbaijan	6	CE & C
=26	Jamaica	6	SIDS
=26	Mauritius	6	SIDS
=26	Austria	6	Eur
=26	Lithuania	6	Eur

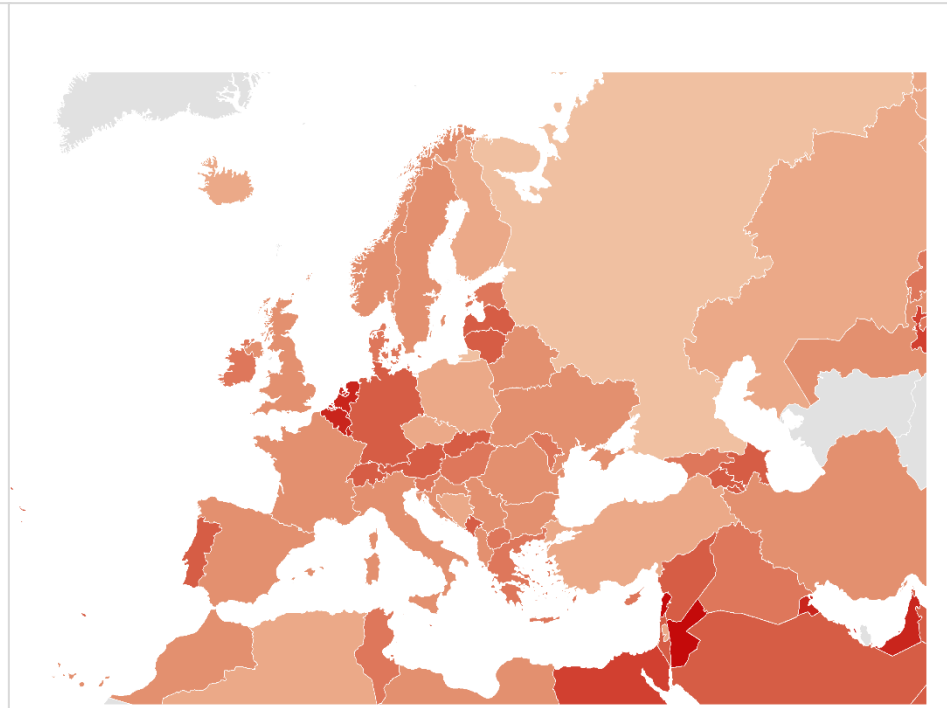
% Top 30

		ND GAIN	TCI Index
SSA	Sub-Saharan Africa	80%	23.3%
MENA	Middle East and North Africa	6.7%	16.7%
SIDS	Small Island Developing States	13.3%	13.3%
Eur	Small European states	0%	30%
CE & C	Central Asia and the Caucasus	0%	10%
SE Asia	South East Asia	0%	6.7%

Exposure in Europe



ND GAIN Index (direct impacts)



TCI Index

Previous national assessment in Sweden

2007 Climate IVA Assessment for Sweden: briefly mentioned TCI

2015 Kontrollstation – up-date, included Annex and more coverage

Source: Mobjörk M. & Johansson B., FOI. Bilaga 4: Klimatförändringarnas indirekta effekter och deras betydelse för Sverige: Underlag till (translation: *The indirect effects of climate change and their significance for Sweden*)

1. Security & Development: Altered threats, demand for intrn. operations; mainstream adaptation into all ODA

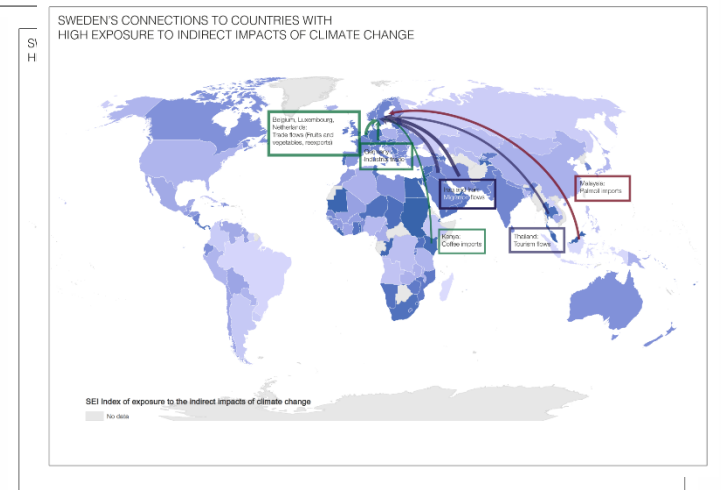
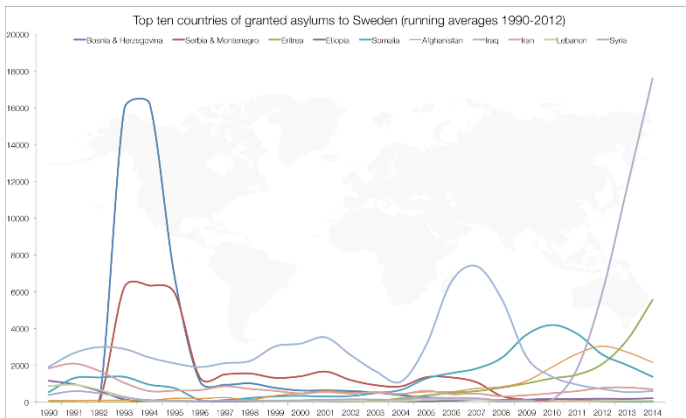
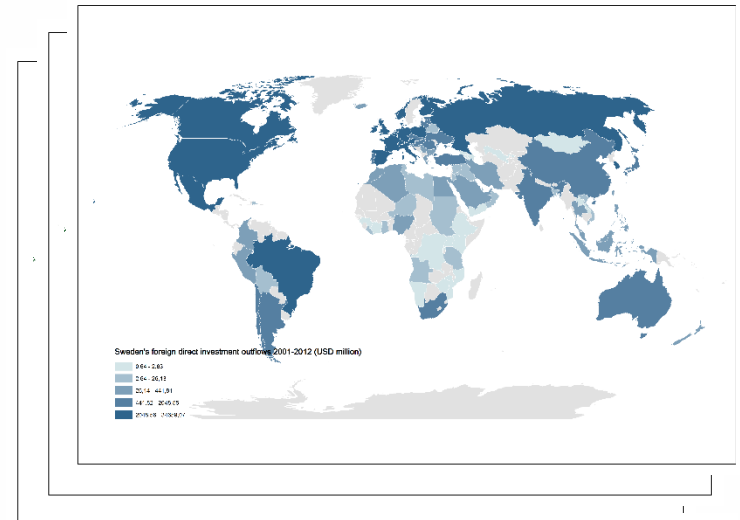
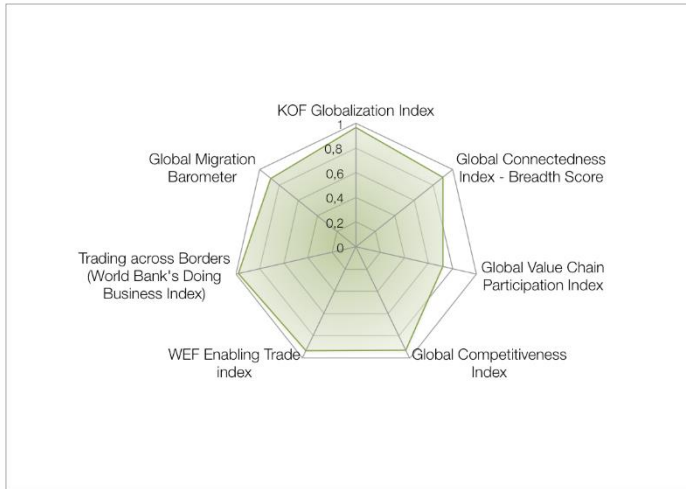
2. Migration: Higher numbers, need to be proactive

3. Agriculture: Food imports increase; demand for Swedish agr. increases

4. Transport & Energy: Critical infrastructure interdependencies (Scand.)

5. Trade & Business: Financial sector matters; *engaging business was seen as a key reason to assess TCI*

Sweden: Previous research by SEI



Conclusions from previous work

- Sweden's connections to countries that are vulnerable to *direct* impacts of climate change are relatively few.
- Sweden's connections to countries that are exposed to *transnational* impacts of climate change are strong, incl. via migration and food imports
- Increasing systemic and cascading risks requires new research methods, tools and policy support that deal with **networks** and **complexity** to understand climate risk
- The appropriate division of responsibility between the State vs. private sector in governing TCI risks remains unclear and largely unexplored

Forthcoming work



Mistra Geopolitics

Investigating the relationship between environmental change, changing geopolitics and sustainable development.

Projects on:

2.1 Conceptualising transnational impacts in a changing geopolitical landscape

2.2 Sweden's exposure to trade-related TCI (SEI)

2.3 Transnational impacts of migration (Uppsala)

2.4 Transnational impacts of armed conflict (PCR, UU)

4.3 Changing resource demands of meeting the SDGs (Lund)

Forthcoming work



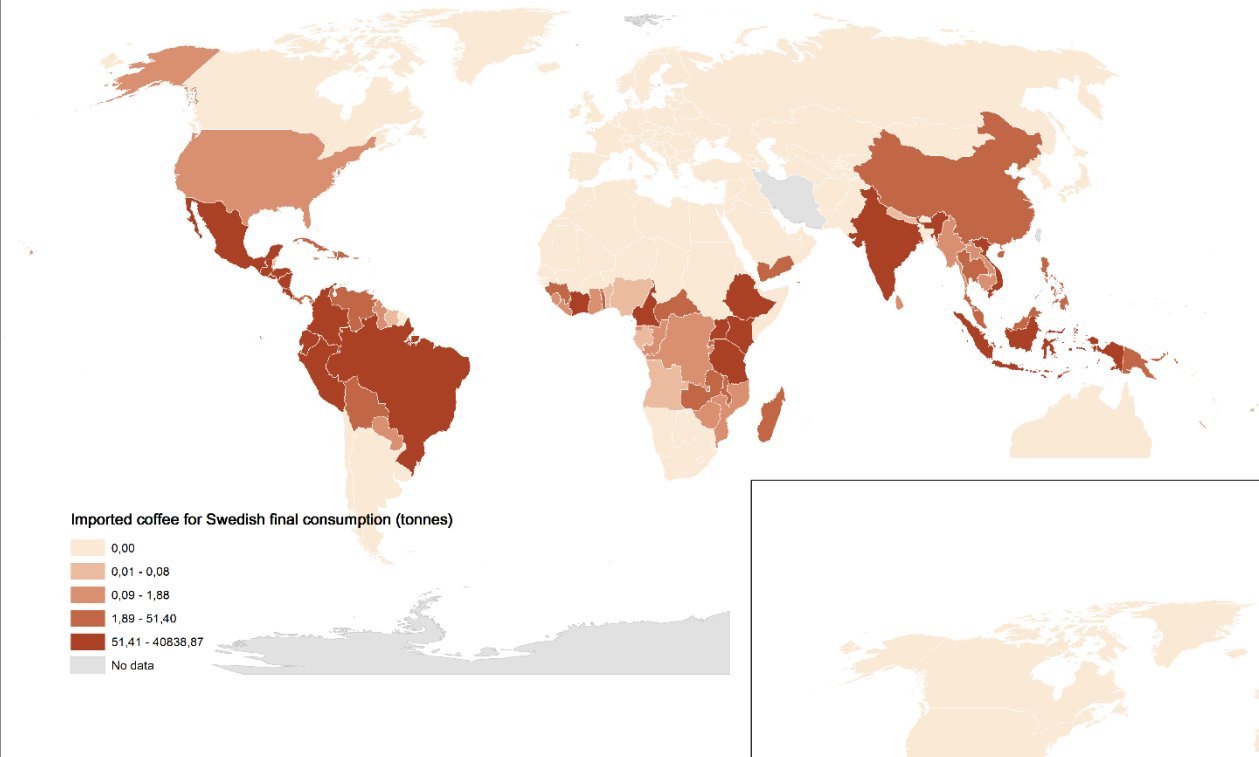
What?

- i. An indicator-based assessment of Sweden's exposure to transnational climate impacts
- ii. Explore government capacity to strategically manage transnational risks

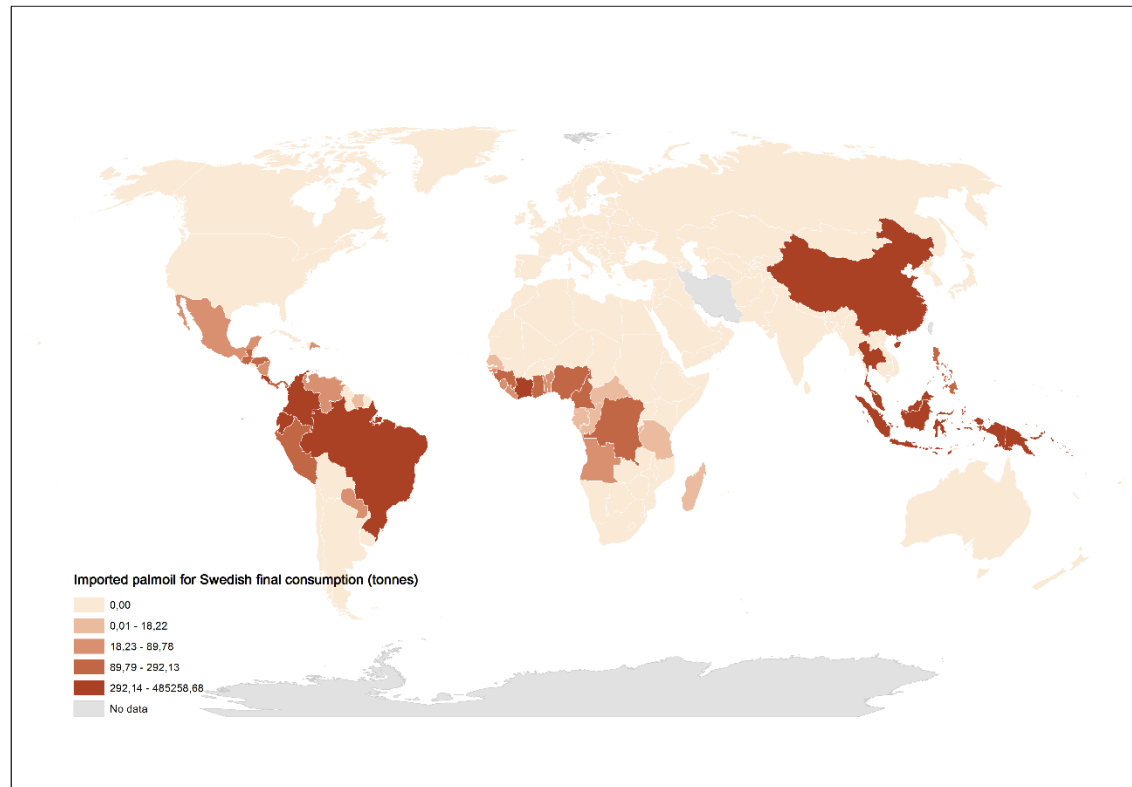
How?

- Assessment of "national interest"
- Quantitative indicators of climate risk exposure via trade pathways
- Network analysis: critical nodes and flows in international trade
- Future perspective: relevance of global change to Sweden's exposure
- Stakeholder engagement: Swedish Govt. ± Key business sectors

Identifying hotspots

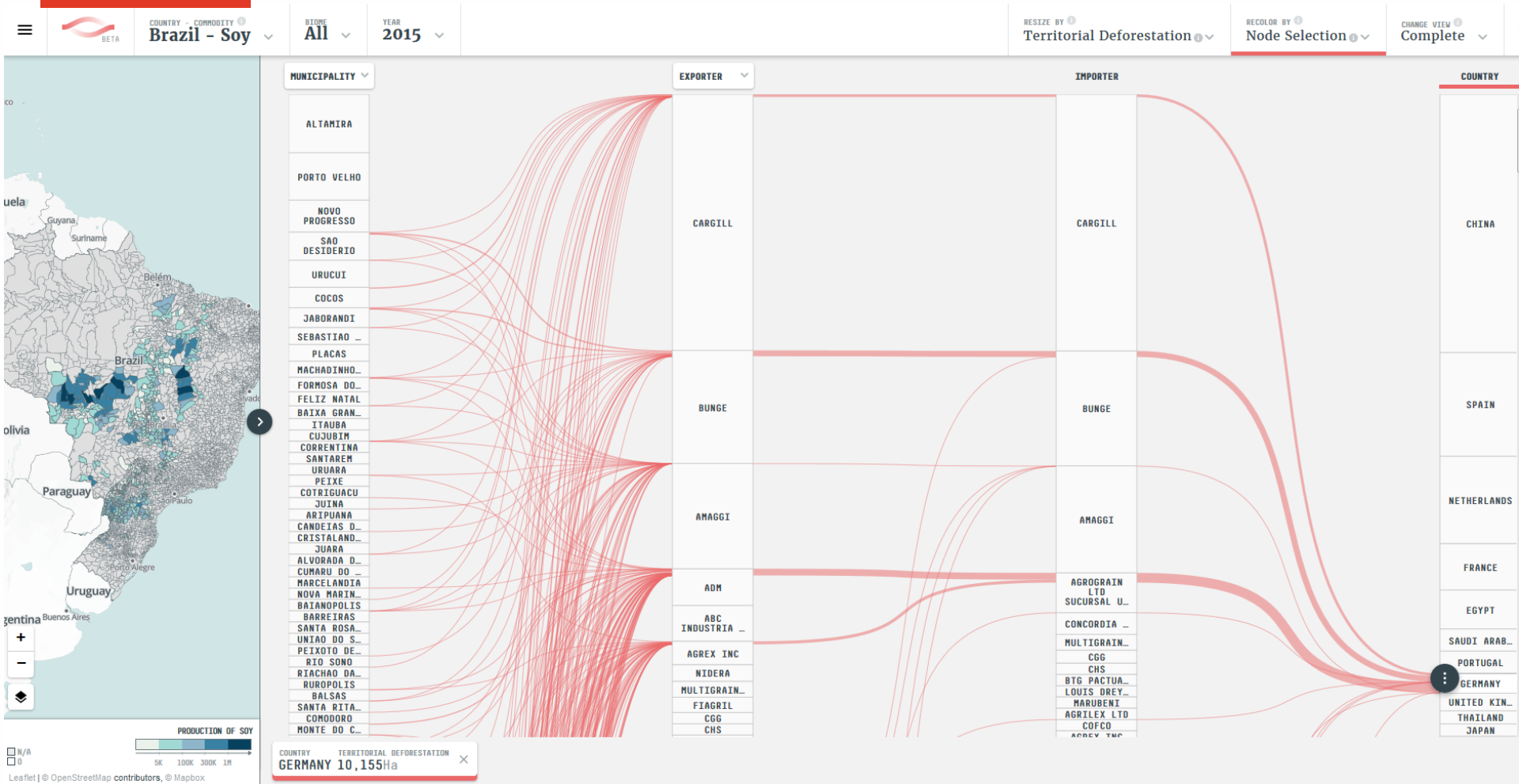


Using SEI's Multiregional
Input-Output model IOTA
(West et al, 2013)
vs. trade statistics





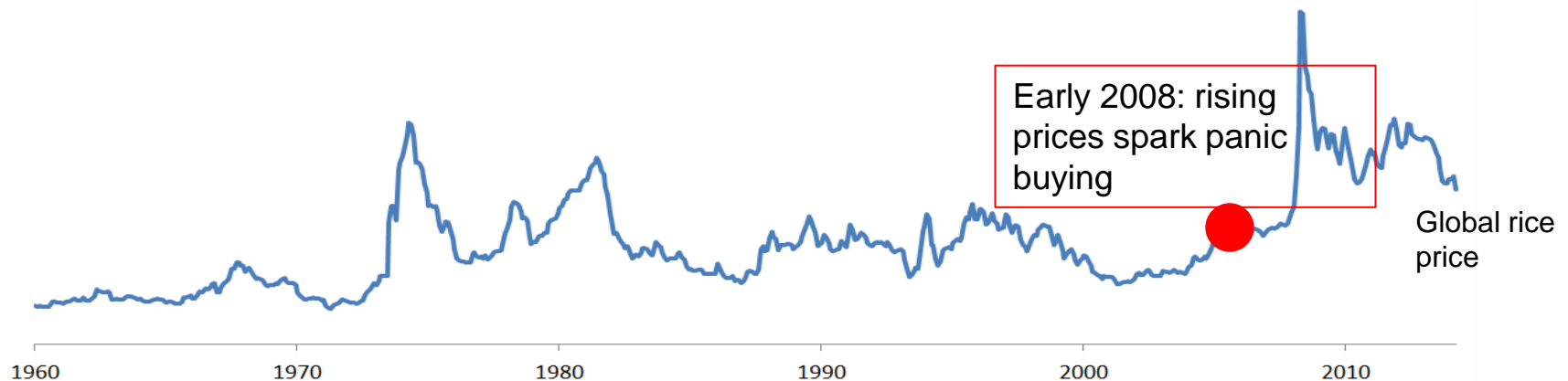
<https://trase.earth>



Price shocks in a changing climate

Empirical observations contradict model assumptions

- Shocks and trade behaviour are key
- Multiple complex drivers of trade shocks
- Climate change will magnify risks

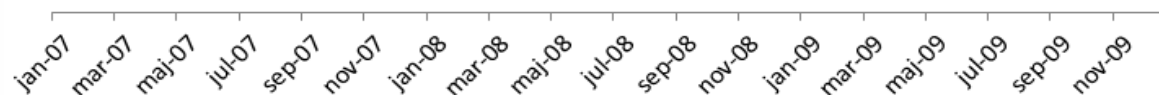


Price shocks in a changing climate



Senegal	Scenario Data from Iglesias and Rosenzweig 2010							Standard			Ratin	Impor share
	A1F	A2a	A2b	A2c	B1	B2	B2	Averag	Deviation	Range		
<i>Producer</i>	<i>% in rice yield change by 2020</i>											
India	-6,1	-	-3,78	-4,8	-	-6,62	-4,93	-4,88	1,13	-3,68; -6,62	⊗	16,2
Thailand	0,75	1,54	0,57	1,46	-0,4	0,78	0,22	0,70	0,68	1,54; -0,4	✓	37,3
Vietnam	-0,7	0,09	0,11	0,04	-	-1,43	-1,12	-0,54	0,63	0,11; -1,43	⊗	16,4
Pakistan	-	-	-4,68	-5,85	-	-5,62	-5,33	-5,11	0,71	-4,09; -5,78	⊗	4,1
World	-2,4	-	-2,39	-1,97	-	-3,77	-3,17	-2,80	0,83	-1,96; -3,96	⊗	26,1
<i>Percent of total grain production from rice:</i>												
Senegal	-	-2,5	-2,72	-2,2	-	-3,79	-3,76	-3,03	0,60	-2,2; -3,79	⊗	Overall:

Source: Schletz (2015) Master's thesis – Rice Trade in a changing climate



Reducing vulnerability to food price shocks in a changing climate



Multilevel adaptation to buffer (climate-driven) shocks in food markets

Global	<p>Address systemic risks</p> <ul style="list-style-type: none"> • Tackle food market speculation (e.g. EU) • Maintain trade openness and export restrictions (e.g. WTO)
Regional	<ul style="list-style-type: none"> • Strategic food reserves (e.g. ASEAN+3, ECOWAS) • W-African rice buying cartel? • Facilitate regional trade
National	<ul style="list-style-type: none"> • Flexible use of trade policy; diversify trade partners • Increase domestic production whilst maintaining crop diversity
Household	<ul style="list-style-type: none"> • Rural: multiple crops • Rural and Urban: diversify diets

Current donor-supported adaptation falls far short

Development cooperation

- Re-consider effectiveness and efficiency of climate finance
- Avoid self-interest as logic for allocating scarce adaptation finance
 - e.g. Securitisation of supply chains; "preventing" migration, etc.
- Prioritise *systemic resilience* in a changing climate
- Reconsider modes of finance and global governance of adaptation
 - e.g. How to allocate finance to maximise food trade stability? Hint: not bilaterally!
- Global Goal on Adaptation in the Paris Agreement
- "Adaptation" beyond the UNFCCC/ finance
 - e.g. Trade regime

Conclusions

Source: Benzie et al (2017)

Pathway (SEI)	Pathway (EEA)	Pathway (FIN)	Example climate impacts on:
Finance	Finance	Financial	Cognitive filter Climate impacts perception/adaptation
People	Human mobility	Human mobility	
Trade	Trade (non-agricultural commodities)	Trade	
	Trade (agricultural commodities)		
	Infrastructure	Infrastructural	
Biophysical		Biophysical	
<i>Global context</i>	Geopolitical risks	Geopolitical	

"System-first"	Literature review	"Impacts first"	Others: <ul style="list-style-type: none"> • National statistics • Expert judgement ("Orders of magnitude" - PwC) • Stakeholder-generated scenarios (e.g. IMPRESSIONS)
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Conclusions

What was the trigger for Sweden to look at these issues?

- Perception of security risks
- Research proposal
- Recognition: devolved approach leaves gap in Swedish govt strategy

What are the key pathways and risks?

- TBC! *Perhaps:*
- Trade, EU_{internal}, import-dependent export sectors (e.g. automotive: Volvo, Skania, etc.),
- Re-think food security
- **Systemic risk** – finance, migration, conflict and insecurity

Conclusions

Lessons learned so far

- Evidence base is thin; demand is low, beyond awareness raising...
- Governments have struggled to assign clear ownership of transnational climate risk management
- Danger of climate risks being un-governed: by countries, UNFCCC and beyond the climate regime
 - Private sector will learn to manage its own exposure according to its own interests
- Curiosity is growing; esp. among globalised, rich countries & at EU
- TCI will affect all countries – poor as well as rich
- Adaptation research and practice must evolve
 - Different stakeholders
 - New disciplines and methodologies
 - Alternative governance options – beyond traditional scope of "adaptation"

MORE INFORMATION AVAILABLE

SEI Working Paper – *Introducing the TCI Index: indicators of country-level exposure* - Methodology, data, maps, etc:

<https://www.sei-international.org/publications?pid=2972>

Policy Brief – *Transnational climate change impacts: an entry point to enhanced global cooperation on adaptation?*

<https://www.sei-international.org/publications?pid=3039>

Benzie et al (2017). *Implications for the EU of cross-border climate change impacts*, EU FP7 IMPRESSIONS Project Deliverable D3A.2.

<http://impressions-project.eu/documents/1/>

Short films, briefs, Prezis, etc. at the *Adaptation without Borders* Theme on weAdapt: <https://weadapt.org/initiative/adaptation-without-borders>