Global Supply Chain Forum
Barbados
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Session A5:
Achieving Sustainable and Resilient Transport and Logistics including in SIDS

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Introduction

Environmental impacts of freight transport - *Negative Externalities*













Recent history of supply chain disruptions

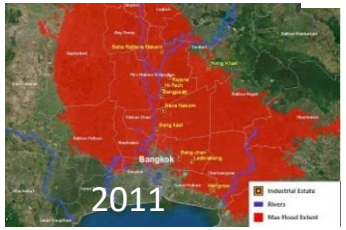
9/11

Hurricane Katrina

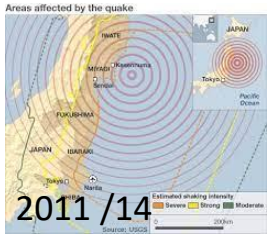
Financial crisis

Volcanic-ash cloud

Thai floods



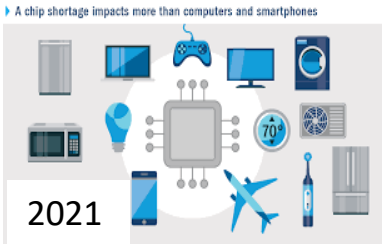
Japan earthquakes



Petya ransomware

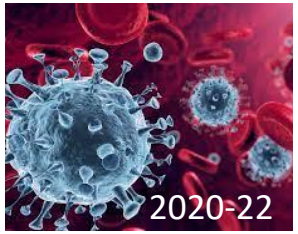
Brexit

Semiconductor shortage



Suez blockage

Pandemic



Ukrainian invasion

Panama drought

Red Sea attacks

Resilience = '*The ability to bounce back from large-scale disruptions*' Professor Yossi Sheffi (MIT)

disruption profiles V U W

Resilience

The supply chain's ability to bounce back and recover to a normal state of affairs

The supply chain's ability to bounce forward and adapt to a new normal

Adaptation

source: Economist Intelligence Unit (2020)

https://bit.ly/3IQPFQA

traditional model of supply chain best practice

- centralization
- single sourcing
- globalisation
- just-in-time replenishment
- minimal inventory
- vertical disintegration
- closely coupled processes
- time compression

greater efficiency at expense of increased vulnerability

'Self-inflicted Vulnerability'

model not sufficiently robust in an era of economic, environmental and geopolitical turbulence.

- and too carbon-intensive for a '*net zero*' future?

Relationship between Resilience and Environmental Sustainability

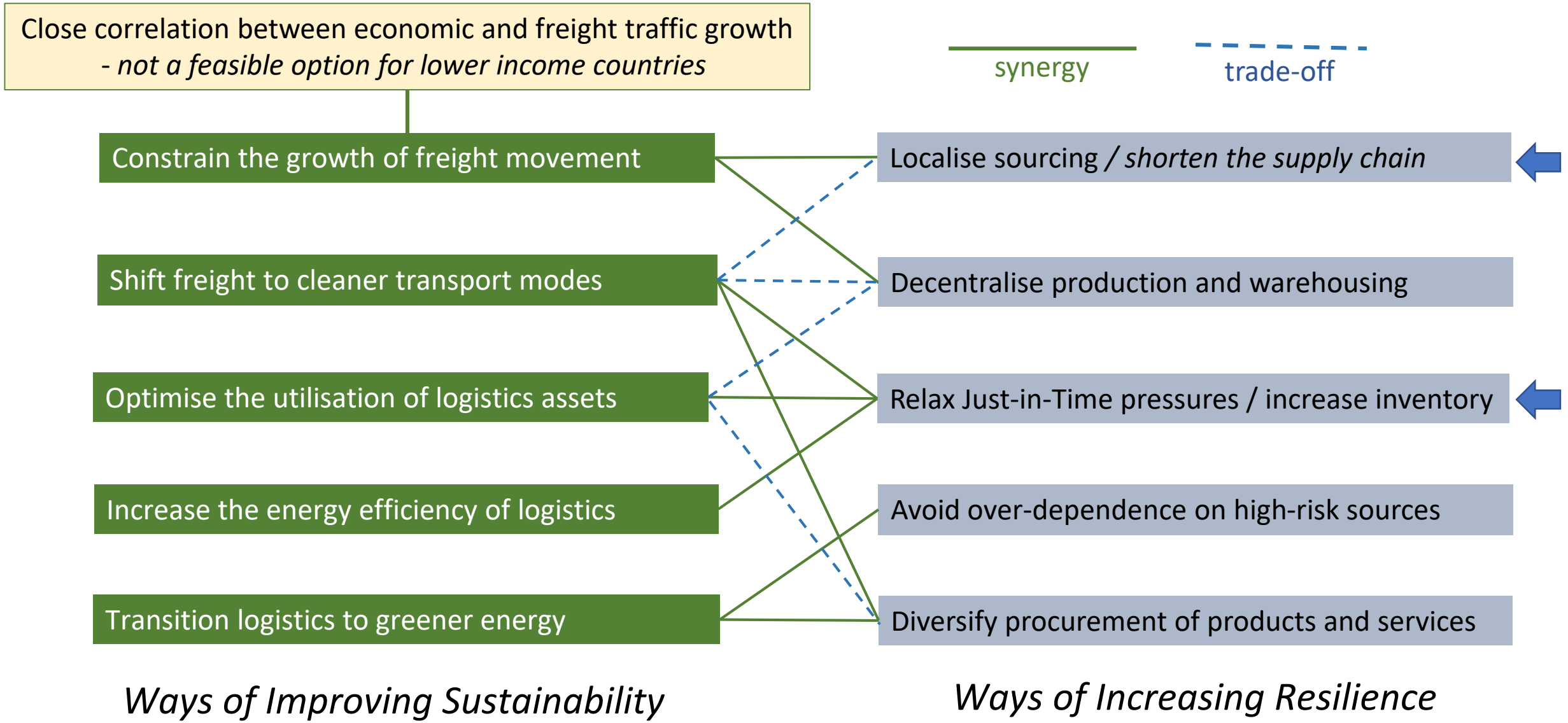
http://bit.ly/3YXd2Qg

In the management of freight transport and logistics, are sustainability and resilience objectives well aligned?

What are the synergies and trade-offs?

- Supply Chain Visibility
- Supply Chain Collaboration

Mapping the Relationships between Sustainability and Resilience in the Management of Logistics



Option 1: Shorten international supply chains*: deglobalisation, reshoring and near-shoring*

likely impact on resilience?

- over-simplified, one-dimensional view of globalisation process – *under-estimates* ***value chain complexity***
- reconfiguring value chains can be a long-term process – *too soon to judge the trend*
- does not necessarily minimise supply chain risk – *can have the opposite effect, concentrating risk in home market*

likely impact on environmental sustainability?

Reducing amount of trade-related freight transport would reduce related negative externalities … BUT

- minimising the distance goods travel does not necessarily minimize **product life cycle** emissions
- international shipping, accounting for over 80% of trade, is by far the lowest-emission transport mode
- damaging to development prospects of lower income countries and their ability to manage environmental crises

Option 2: Relax Just-in-Time pressures – *increase inventory*

Resilience and sustainability impacts?

Supply chains: companies shift from 'just in time' to 'just in case'

Businesses exposed by pandemic shortages and shipping bottlenecks are being forced to rethink their operations

Just-in-time for supply chains in turbulent times

Thomas Y. Choi[1] | Torbjørn H. Netland[2] | Nada Sanders[3] | ManMohan S. Sodhi[4] 2023
Stephan M. Wagner[2]

https://bit.ly/3S9ruER

'debunk misconceptions underlying the arguments in the popular press'

Selective relaxation of JIT pressures on sourcing of **more critical materials and components**

Relaxation of JIT – possible impacts on the sustainability of **freight transport**

- more time to consolidate loads and find backhauls: *improves vehicle loading*
- easier *modal shift* to slower, lower-carbon transport modes
- lowering *vehicle speeds* saves energy

But higher energy use and emission from production and warehousing?

need a **holistic assessment** of emission impact of relaxing JIT

- JIT is a whole business philosophy – *not just a stock control system*
- production operations, delivery systems and storage capacity are adapted to JIT replenishment
- time and investment needed to move to more agile, higher-inventory production and distribution model

Sustainability and Resilience of Freight Transport / Logistics in **Small Island Developing States**

location, size, heavy trade dependence, reliance on single transport mode and low freight volumes amplify the effects of global supply chain disruptions

SIDS are relatively vulnerable to natural hazards
1970-2020: cost SIDS $153bn (17% of GDP)

'*Small islands present the most urgent need for investment in capacity building and adaptation strategies*' IPCC 2022

Very close link between economic development, resilience and sustainability

Switch from fossil to renewable energy will offer sustainability and resilience benefits

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