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# Vulnerability of logistic structures in grocery business

## Is our food-supply vulnerable?

**Thesis:**

**YES!**

**but why?**



IDRC 2008



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# Vulnerability of logistic structures in grocery business

## Definition of trade:

Trade balances demand and supply of  
goods in respect to:

- space
- time
- amount



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# Vulnerability of logistic structures in grocery business

## Definition Logistics

Logistics is *that part of the supply chain process* that plans, implements, and controls the efficient flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements''

Source: CLM 1998

IDRC 2008



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## **Vulnerability of logistic structures in grocery business**

**Public demand towards the grocery  
business:**

**Beverages & Food**

**available every day and under all  
circumstances**



## **Vulnerability of logistic structures in grocery business**

### **Because of natural risks:**

- **atmospheric events**
  - **storm**
  - **rain / snow**
- **geological events**
  - **earthquake**
- **cosmic events**
  - **solar flare /  
radiation**



## **Vulnerability of logistic structures in grocery business**

### **Because of human factors:**

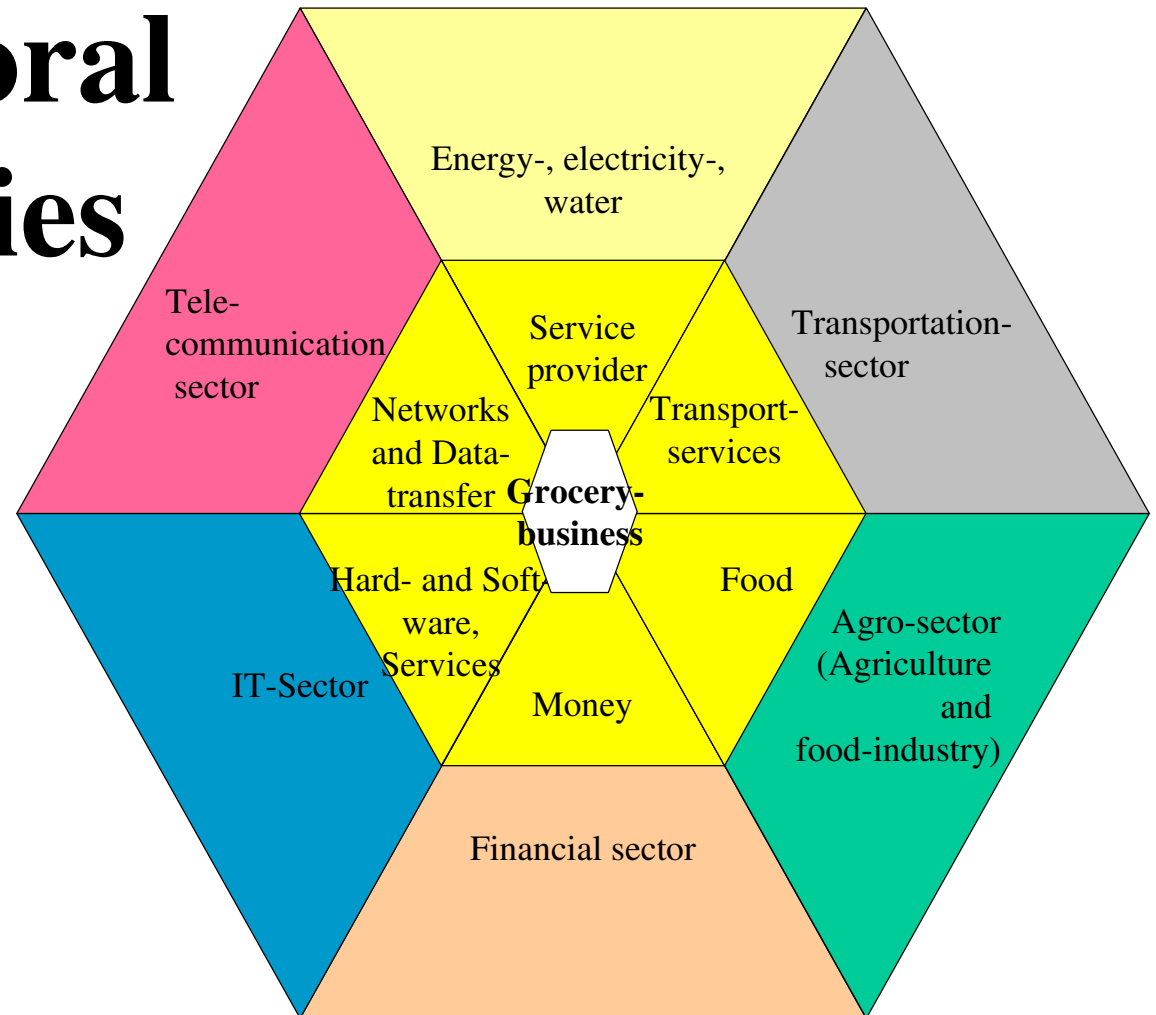
- **human failure**
  - **accident**
  - **handling errors**
- **with malice  
aforethought**
  - **criminal act**
  - **terrorism including  
cyber terrorism**



# Vulnerability of logistic structures in grocery business

## Because of sectoral interdependencies

- Agriculture and food-industry
- Transport
- Finances
- Energy
- Communication
- IT



## **Vulnerability of logistic structures in grocery business**

**Because the grocery-business uses a  
highly complex logistic-system:**

- **Few logistic centers for many outlets**
- **Sales data are transmitted „online“ from the outlet to the headquarter**
- **Transport and exchange of information substitute stocks**





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# Vulnerability of logistic structures in grocery business

## Possible event:

- **blackout**
- **disruption of telecommunication**
- **inaccessibility of data**
- **disruption of transport**

## Effects to food supply:

- **shops cannot open**
- **logistic centers cannot operate**
- **no sales-data, no orders**
- **no money (no payment by credit-/debit-card)**
- **no orders**
- **no supply for the outlets**



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# Vulnerability of logistic structures in grocery business

## Risks for the flow of goods and information

Supply side

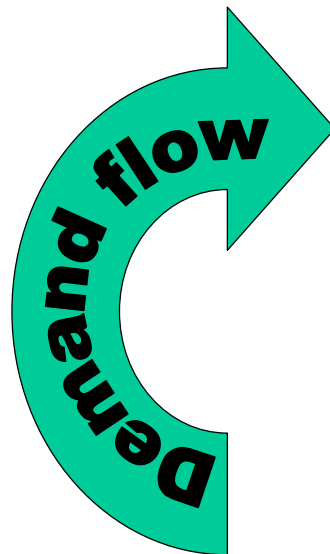
Storm

Hacker attack

Earthquake

Strike ...

Demand side



Demand flow =  
Sales data generation  
Data transmission  
Data processing

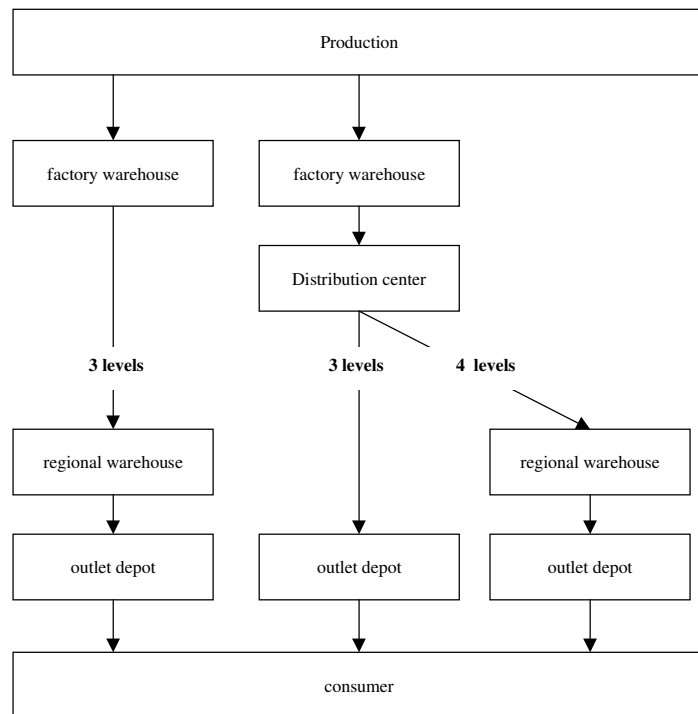
Product flow =  
Data processing  
Production of goods  
Transport of goods

# Vulnerability of logistic structures in grocery business

## Supply-Chain

**Yesterday**

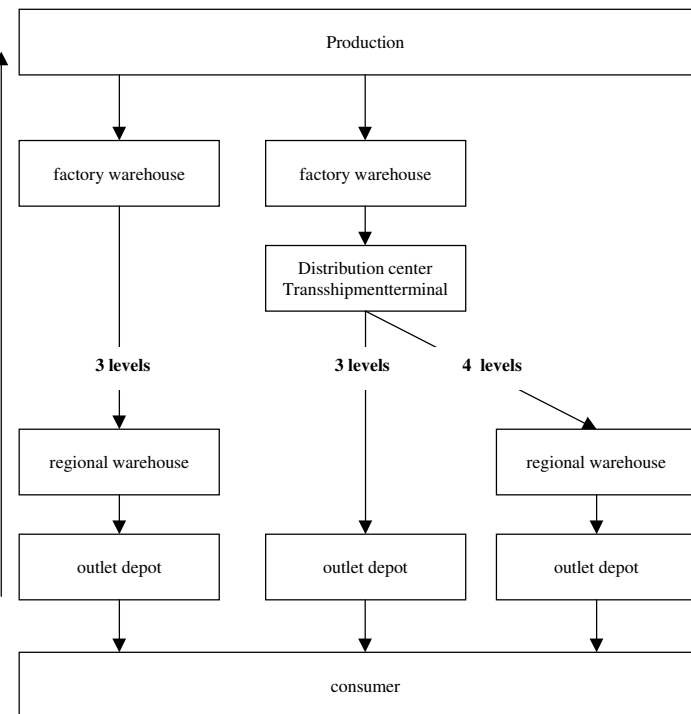
Sales-data send once a day or week in printed form



High stocks on every level

**Today**

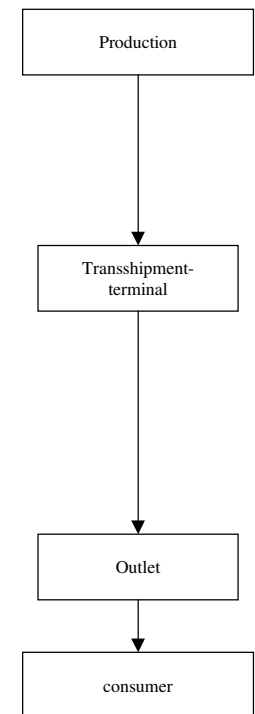
Sales-data send daily via data-transfer



Low stocks on every level

**Tomorrow**

Sales-data send permanently via data-transfer

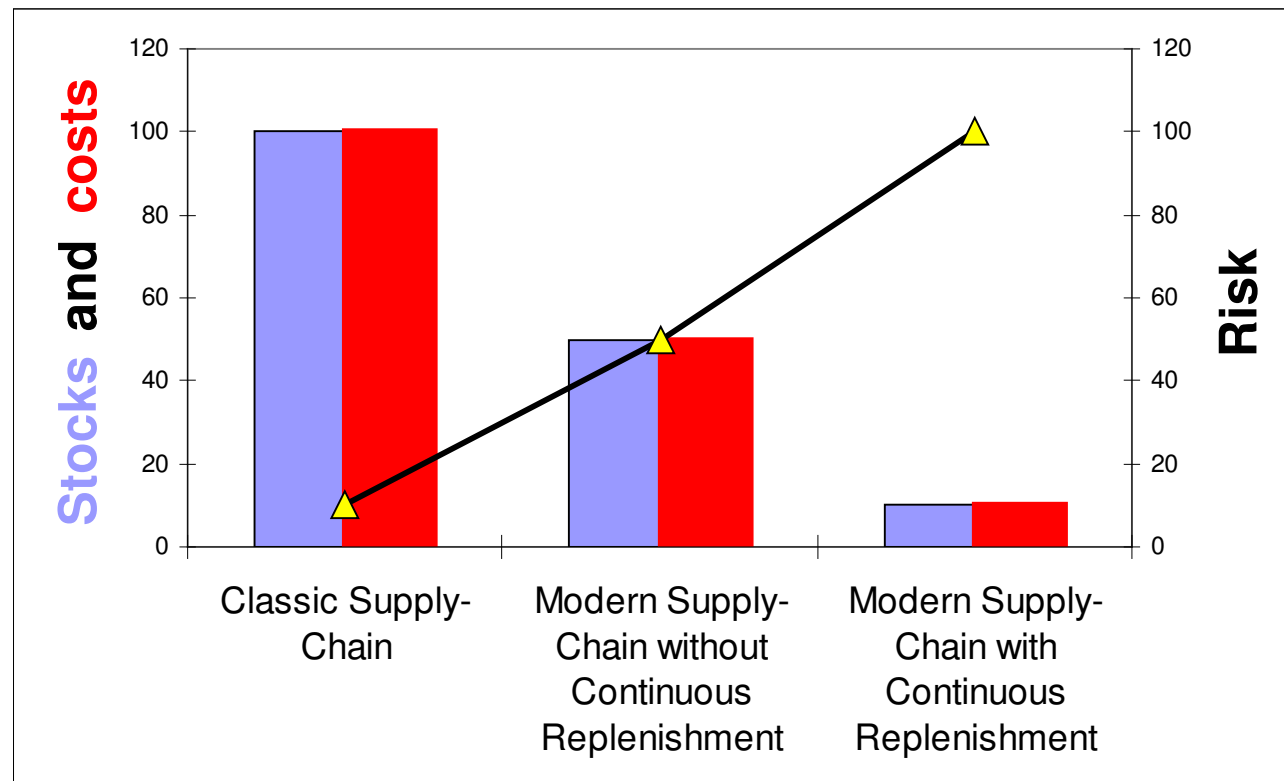


No stocks

# Vulnerability of logistic structures in grocery business

“Continuous Replenishment” the key to low costs

Stocks  
and  
Costs



Risk



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# **Vulnerability of logistic structures in grocery business**

## **Survey results**



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# Vulnerability of logistic structures in grocery business

## • **Outlet:**

- **only a few have emergency / standby generators**
- **stocks are sufficient for only one day**
- **no sales without electricity**



## **Vulnerability of logistic structures in grocery business**

- **Logistic centers (LC)**
  - **only a few have emergency / standby generators**
  - **manual handling of goods is impossible**
  - **failure of an LC has effects on adjacent regions**
  - **stocks are sufficient for only one week**



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# Vulnerability of logistic structures in grocery business

## Effects of a hazard

- **are not limited to the affected region**
- **extend into neighbour region by networking**
- **change by interaction**
- **are amplified by interaction**



## **Vulnerability of logistic structures in grocery business**

# **Supply-chain safety increases with:**

- **redundant systems**
- **electricity independent data (printed list)**
- **high number in staff for manual work**
- **high stocks on all levels**

**but costs increase too!!**



## Vulnerability of logistic structures in grocery business

### Cost efficient internal measures:

- **develop concepts to cope with possible hazards**
  - **sell with manual till**
  - **“sell” without money (if financial sector fails)**
  - **sell directly from trucks**
  - **prepare a list of goods which can be consumed in a crisis**
- **do exercises for different scenarios**

## **Vulnerability of logistic structures in grocery business**

### **Cost efficient external measures:**

- **develop concepts together with:**
  - **government**
  - **disaster management organisations,  
agency for technical relief**
  - **non-governmental organizations**

## **Vulnerability of logistic structures in grocery business**

### **Cost efficient measures at “day X”:**

- **prepare the actors for the upcoming event and damage**
- **fill up the stocks at all stages of the supply chain**
  - **specially in the outlets**

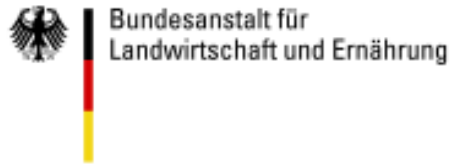


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## **Vulnerability of logistic structures in grocery business**

### **Further cost efficient measures:**

- **warn the public and relevant institutions as early as possible**
- **estimate and publish possible damages and their interactions for all relevant economic sectors**



# **Vulnerability of logistic structures in grocery business**

## **Thank you for your attention**

For more details please send a message to

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