Global Food Security Seminar

SUSTAINABILITY ISSUES IN AGRI-FOOD SUPPLY CHAINS DRIVEN BY WATER SCARCITY

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Agenda

Background information

1. Food security and Water scarcity – new challenges
2. Food security and Water – recent initiatives/practices
3. Research objectives
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6. Gaps in the literature
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“Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”

(World Food Conference, 1996)

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Background information

- **Growing population** requires extra food production, which results in excessive water usage and water pollution. Water resources are limited due to the finite supply of water (Renault et al., 1999)
- **Water scarcity** is an issue that could lead to food availability and food security problems, threaten the existence of certain businesses, and hamper countries' economic developments (Sarni, 2011; CIRAD, 2013)
- Additionally, policymakers and NGOs impose **stringent water usage laws, regulations, and certifications** on companies (Higgins et al., 2008)
- Consequently, in order to response to a changing business environment and to reduce pressure from scarce natural recourses companies searching for **possible solutions** to sustain their businesses (Smith, 2008; Feng et al., 2011)

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1. Food security and water scarcity – new challenges

- Water scarcity issues driven by :
  - globalization
  - urbanization
  - industrialization
- Inefficient water treatment results in :
  - contamination of water with pesticides and fertilizers
  - increased salinity of earth
- Climate change:
  - rainfall pattern
  - monsoon season
  - desertification

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2. Food security and water – recent initiatives/practice

Initiatives from:

- Government
- NGOs
- Community
- **Firms (through Agri-Food Supply Chain)**

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3. Research objectives

The aim of the research is to examine how firms and their extended supply chains are responding to the challenge of water scarcity in terms of **product and supply network design, water conservation strategies, sustainability metrics, and reporting in different regions (developing and developed world)**

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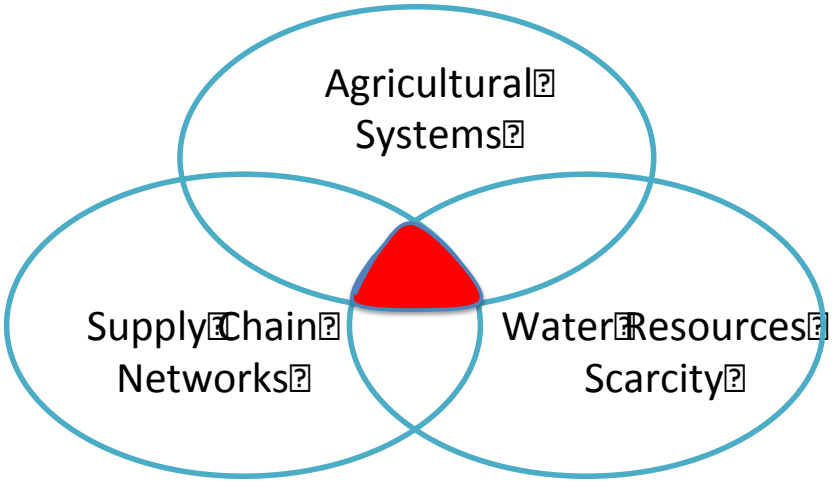
4. Literature domains



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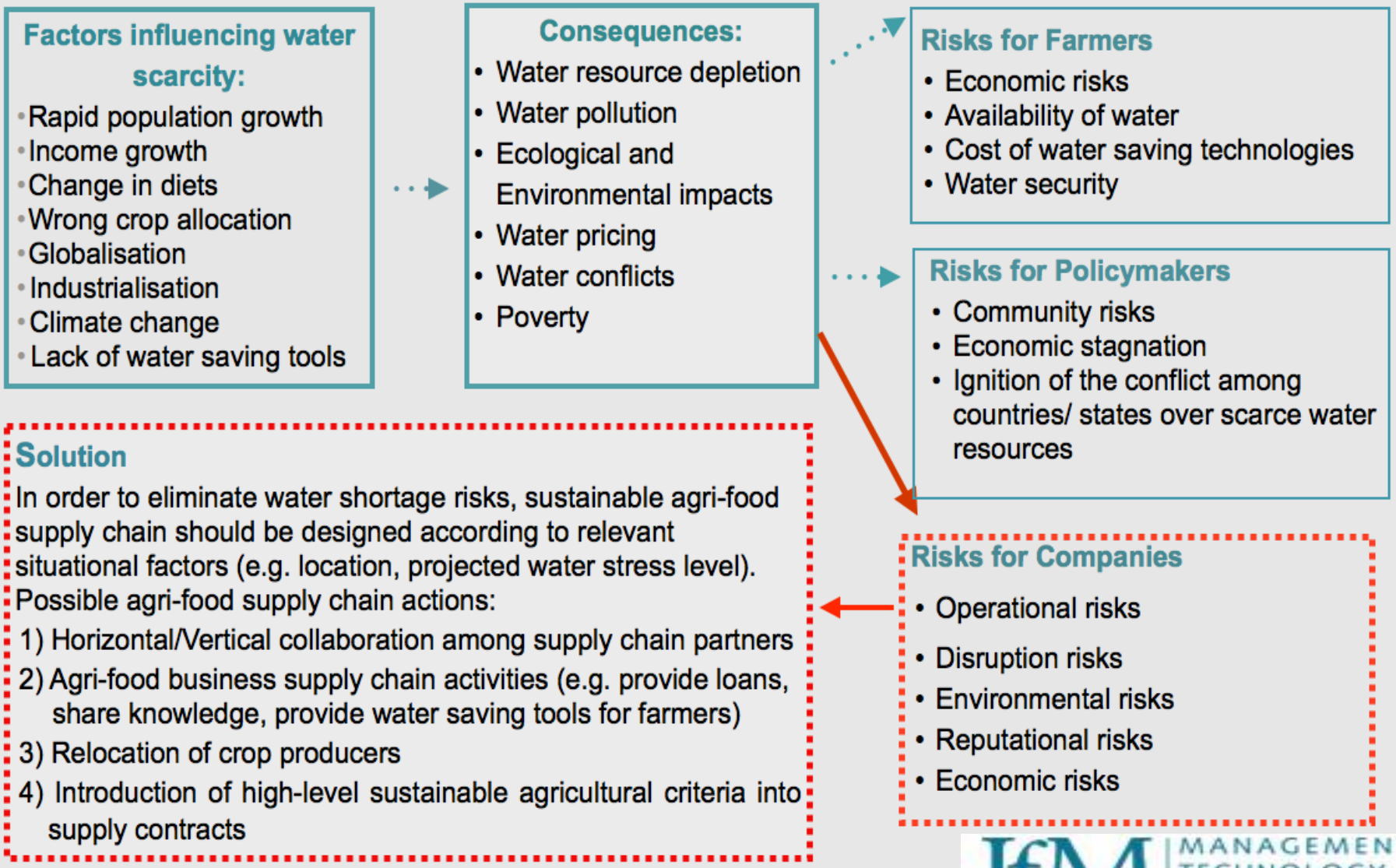
Literature review



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5. Possible companies' resolution activities to eliminate water scarcity issue

- Sustainable agri-food supply chain should be designed according to relevant situational factors (e.g. location, projected water stress levels)
- Horizontal/Vertical collaboration among supply chain partners
- Agri-food business supply chain activities (e.g. provide loans, share knowledge, provide water saving tools for farmers)
- Relocation of crop producers
- Introduction of high-level sustainable agricultural criteria into supply contracts

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6. Gaps in the literature

Early research exhibits a distinctive lack of:

- an aggregate/systems approach to the evaluation/mitigation of risks from water shortage in agri-food supply chains
- an aggregate approach to reconfiguration of food supply chains to mitigate effects of water scarcity
- a unified government water policy implemented throughout different regions worldwide

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7. Perspective work

- Interdisciplinary study on climate change, water scarcity risks, and agri-food allocation throughout different regions in conjunction with supply chain reconfiguration

- Interdisciplinary study on crop selection according to climate change factors and water availability levels throughout different regions

- Food supply chain reconfiguration strategies that take into account availability of water resources

Thank you!

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