



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

The knowledge synthesis

How can a review and synthesis be systematic?

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Work Science, Business Economics and Environmental Psychology

Background

The National Food Strategy for Sweden
Formas

Special call (2017): Syntheses within the food area
Describe the knowledge status and knowledge needs within
the food area.

Systematic reviews and knowledge syntheses



Main review types....

Critical review

Literature review

Mapping review/systematic map

Meta-analysis

Mixed studies review/mixed methods review

Overview

Qualitative systematic review/evidence synthesis

Rapid review

Scoping review

State-of-the-art-review

Systematic review

Systematic search and review

Systematized review

Umbrella review

The "narrative" review

- Seeks to identify most significant items in the field
- Typically narrative synthesis, can be conceptual, chronological, thematic
- No described method of selection of articles (not replicable)
- No formal quality assessment (but may be included)
- Inclusion of studies can be systematic-like, but also based on intuition and research experience → easily biased

The systematic review

- A clearly stated set of objectives with pre-defined eligibility (selection) criteria for studies
- An explicit, reproducible methodology and a systematic search that attempts to identify all studies that meet the eligibility criteria
- Protocol-based data extraction, evaluation of data, assessment validity of the findings of the included studies (risk of bias)
- A systematic presentation, and synthesis, of the characteristics and findings of the included studies
- The synthesis is based on the extraction and synthesis guidelines such, as PRISMA

Example of selection process

Nature-assisted therapy – Systematic review

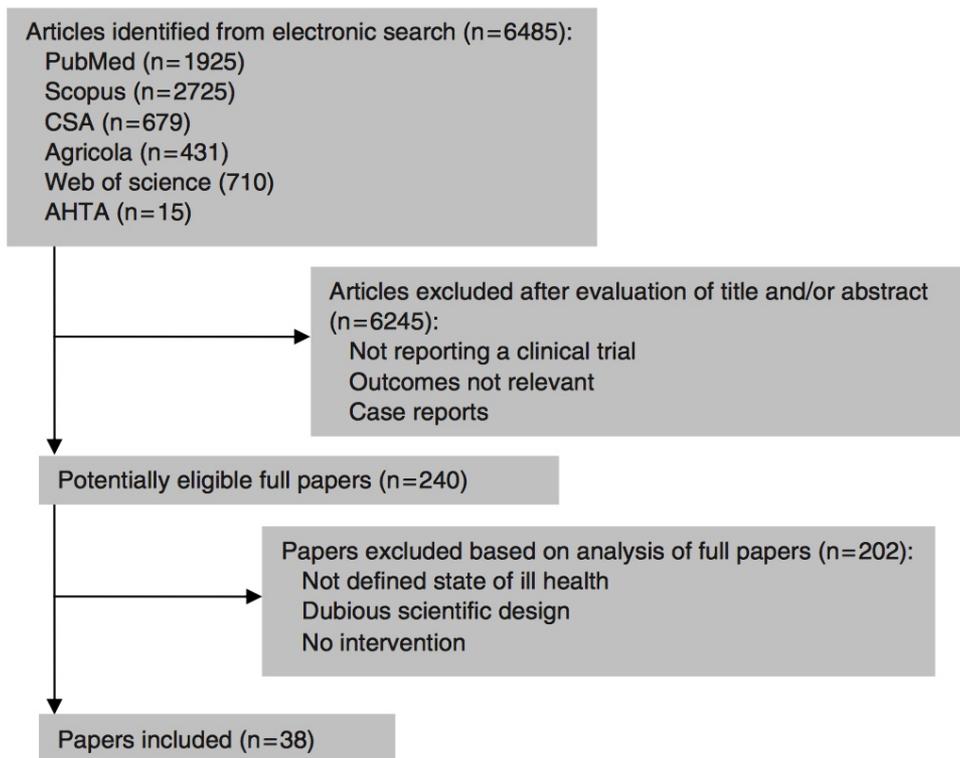


Figure 1. Process of study selection.



PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	



PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.



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Innovation systems for a sustainable agri-food sector

A review and knowledge synthesis

Fredrik Fernqvist and Sara Spendrup, AEM

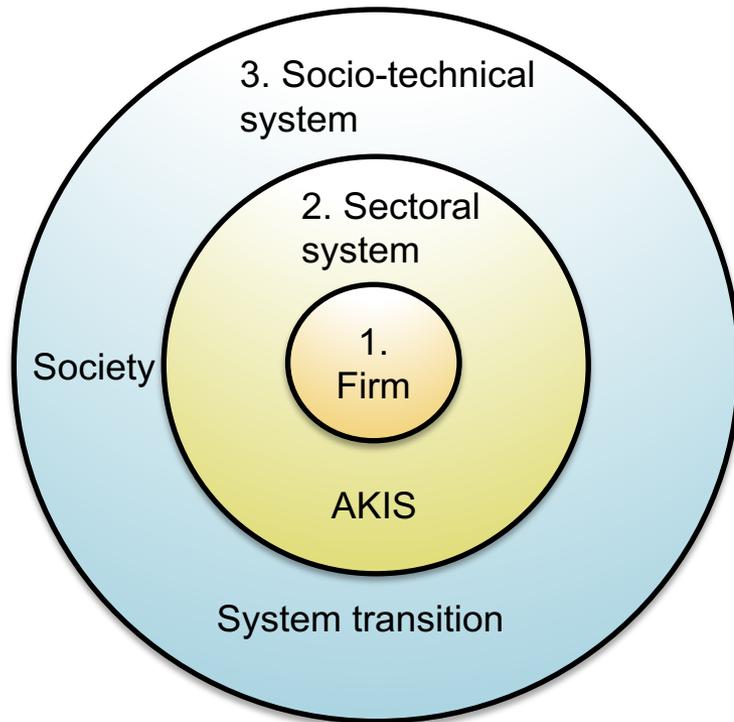
Lisa Germundsson, reference group coordinator, Partnerskap
Alnarp

Background

- Need for innovation in agri-food, but lack of knowledge
- Increase competitiveness in the sector
- Respond to changes in the macro environment (climate change, consumer behaviour, technological change etc)
- The present Agricultural knowledge and innovation system (AKIS) not effective: OECD, EU, Swedish government point – improvement is needed
- 16-18 years from research to positive economic effects

→ What is needed? What should the actors do?

Model - Three system levels





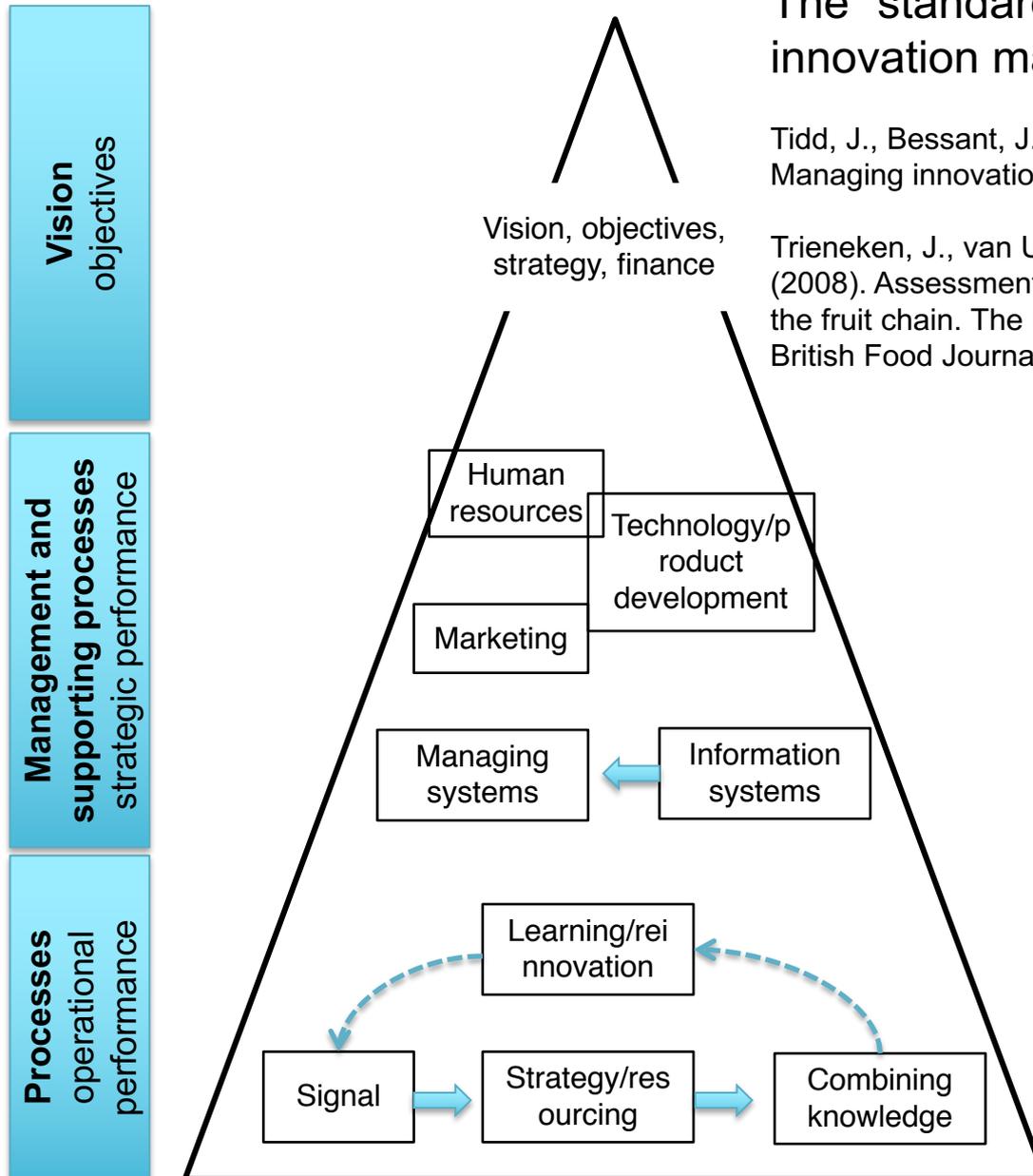
1. Firm level (firm, organization)

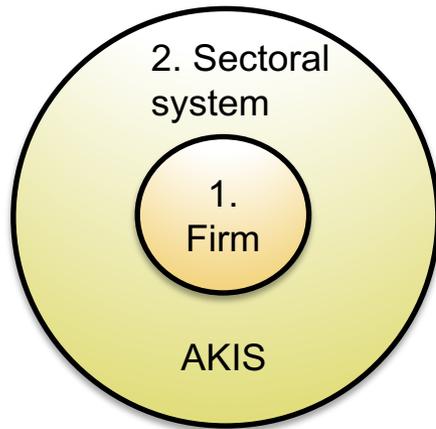
What determines successful knowledge building, learning, innovation development or/and improvements of innovation capabilities in the agri-food sector?

The "standard" approach to innovation management.

Tidd, J., Bessant, J. & Pavitt, K. (2001). *Managing innovation*, 2nd ed., John Wiley & Sons, NY.

Trieneken, J., van Uffelen, R. , Debaire, J. & Omta, O. (2008). *Assessment of innovation and performance in the fruit chain. The innovation-performance matrix.* *British Food Journal* 110(1):98-127.





2. Sectoral level

On the level of Agricultural Knowledge and Innovation Systems (AKIS), sectoral system level-what characterizes successful knowledge exchange and diffusion, as well as knowledge and innovation development within the agri-food sector?

Figure S.1 Actors in the AKIS directly relevant for agricultural innovation in the food chain

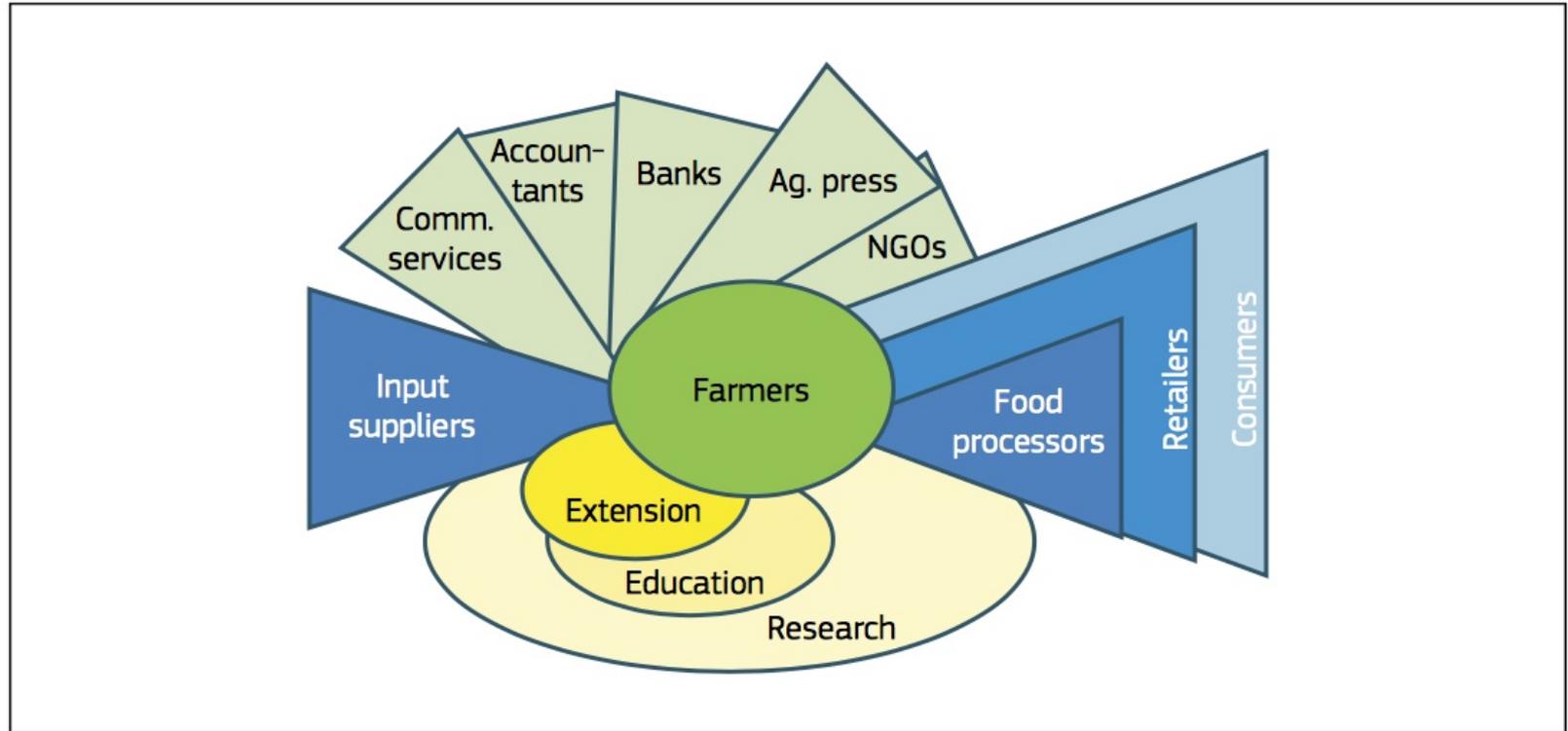
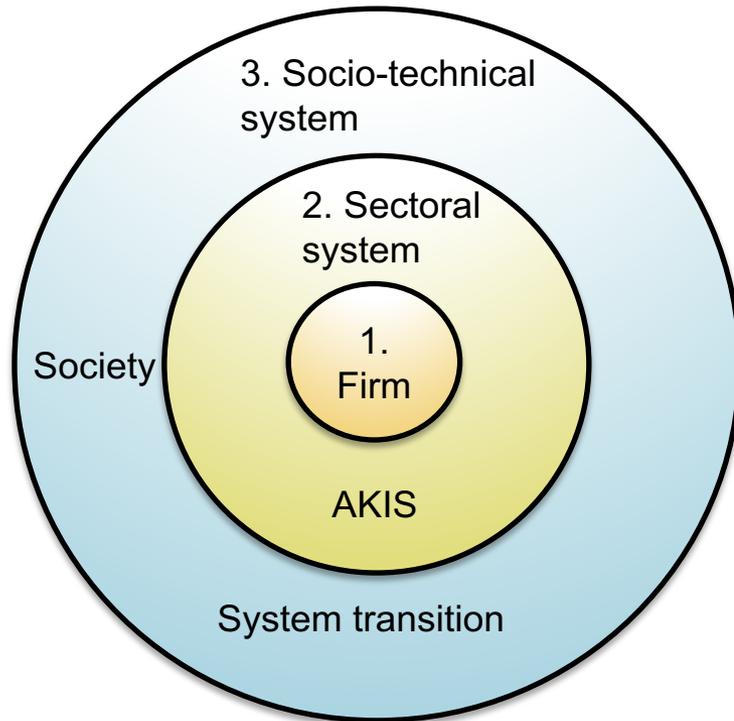


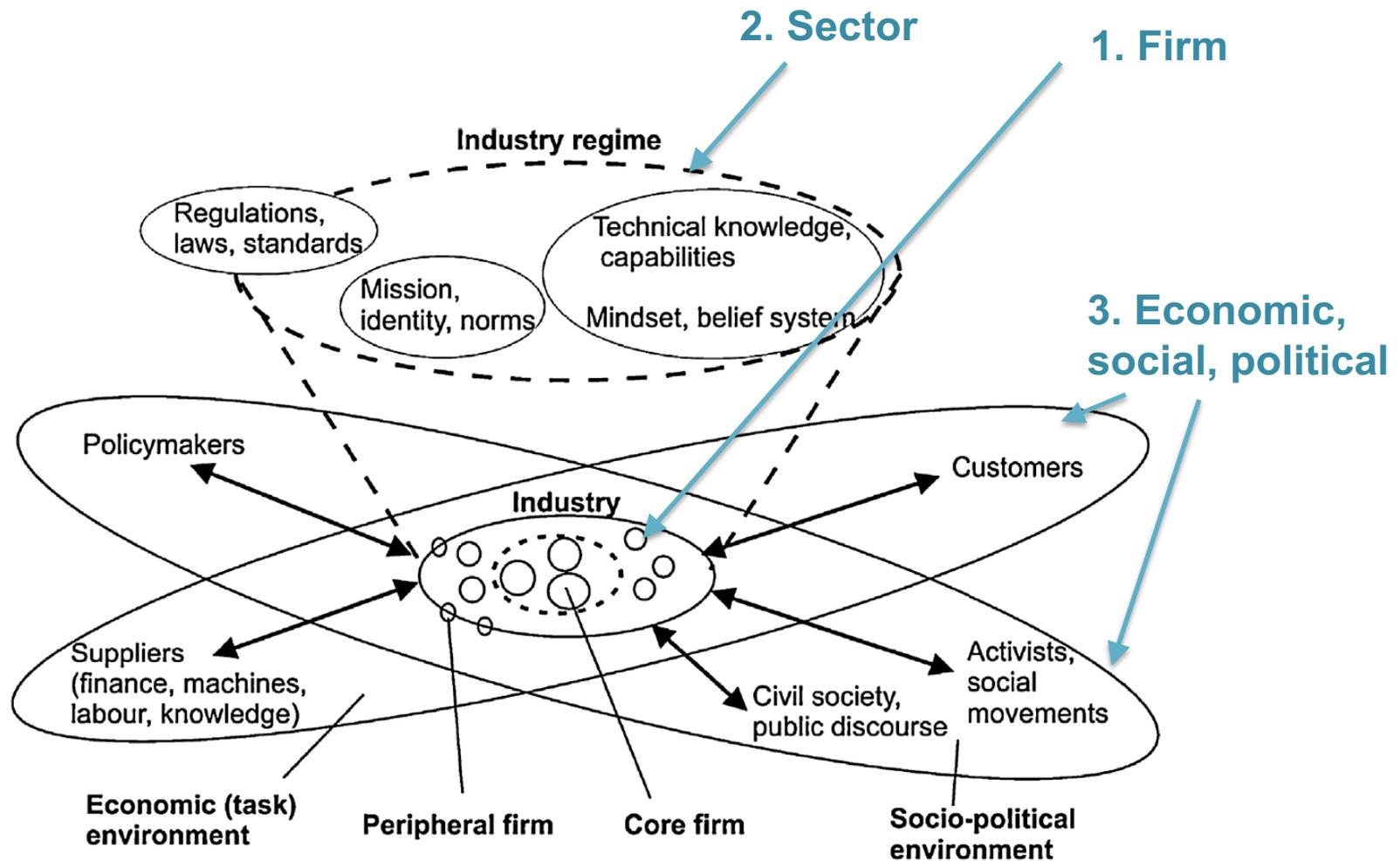
Figure from EU/SCAR AKIS Working group, 2012



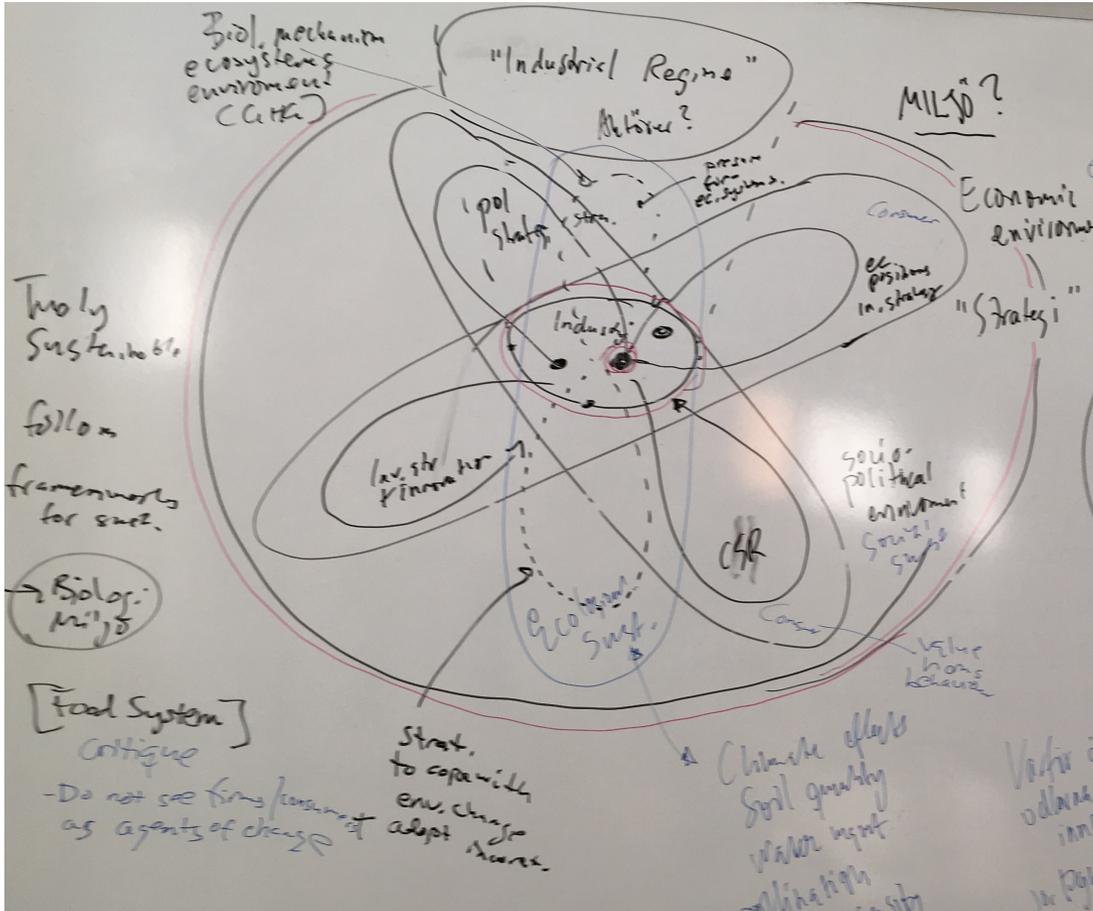
3. Socio—technical system

Society, politics, environment, technology

How does impacts (from e.g. Climate change and environment) and societal transformation affect development, diffusion and use of knowledge, and the effect on future innovation capabilities within the agri-food sector?



Example: From Geels Triple Embeddedness Framework (Geels, 2014)



Own elaboration

Economic environment

Socio-political environment

+ Ecological environment

Table 1. Framework for theoretical basis of the review.

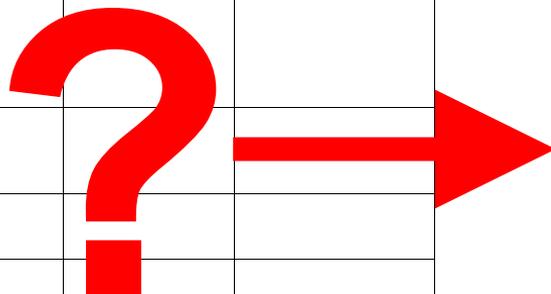
The review includes literature that from different perspectives refer to innovation in different dimensions.

Vertically, the basic elements of a system of relevance for innovation

Horizontally, three dimensions (

Note that this is a preliminary point of departure, which may change during the course.

<i>Basic elements of a sectoral system (Socio-technical system)</i>	Firm level	AKIS-level (sectoral system)	Socio-technical system (transition/evolution /direction/ trajectories of change)
Products ¹			
Agents (firms, non-firms, individuals, universities) ^{1,2}			
Knowledge and learning processes ^{1,2}			
Basic technologies, inputs, demand and the related links and complementarities ¹			
Mechanisms of interaction both within firms and outside firms ^{1,2}			
Processes of competition and selection ^{1,2}			
Institutions (standards, regulations, labour markets, etc) ^{1,3}			
End-users (consumers and related groups) ^{2,3}			
Diffusion and use of technology ^{2,3}			
Impacts (e.g. environmental, climate, social impacts) ^{2,3}			
Societal transition ^{2,3}			
Distribution (networks/markets/infrastructure) ³			



¹Elements derived from Malerba, 2002 (sectoral system)

²Elements of capabilities: (selective/strategic capability; organizational/coordinating ability, functional ability and learning/adaptive ability). Carlsson et al 2002

³Elements derived from Geels, 2004 (socio-technical system) and 2014 (TEF)

Note: these were the preliminary elements.

Systematic review, Cochrane

Interviews with reference group identify search variables (feb)

→OECD presents report on the Swedish AKIS in March (prel.)

Reference group:

Joel Karlsson, Jordbruksverket

Wiktoria Bondesson, LRF

Lotta Törner, Livsmedelakademin

Anders Högberg, Orkla foods

Alexander Milanov, Rise

Ove Karlsson, kompetenscentrum

företagsledning

Christian Malmberg, Lantmännen

Experiences so far

- The original idea rather complex, difficult to do a systematic search of literature with so many variables (including both qualitative and quantitative studies, and systems perspective)
- Possibly follow the process of "systematic mapping"
- Search criteria (after discussion with the library)
- Contact the professionals → The librarians are fantastic!
- The reference group is a good help for understanding what is important for practice and to find criteria