Role, positioning, and skills of innovation managers and boundary network leaders, re-organizing research and extension for co-innovation

Laurens Klerkx, Knowledge, Technology and Innovation Group

WAGENINGEN UR
For quality of life

Overview

- Approaches to innovation
- Approaches to boundary work & brokering
- A co-innovation case
- Boundary work & brokering in processes
- Implications for AKIS: research and extension

Changes in thinking on support of innovation

Broadly, four subsequent perspectives:

1. Diffusion and adoption perspective
2. Farming systems research perspective
3. Agricultural knowledge and information systems (AKIS) perspective
4. Agricultural innovation systems (AIS) perspective (called in EU circles agricultural knowledge and *innovation* systems)

Comparison

	Diffusion & adoption	FSR	AKIS	AIS
Era	Central since 1960's	From 1970's/ 1980's	From 1990's	From 2000's
Mental model	Supply technologies through pipeline	Learn farmers constraints through surveys	Collaborate in research and extension	Co-develop innovation in partnerships
Knowledge and disciplines	Single discipline driven (e.g. breeding)	Multi-disciplinary (agronomy and economics)	Inter-disciplinary (plus sociology and farmers)	Trans-disciplinary, holistic systems perspective
Drivers	Supply push from research	Diagnose farmers' constraints and needs	Demand-pull from farmers	Responsi-veness to changing contexts and patterns of interaction

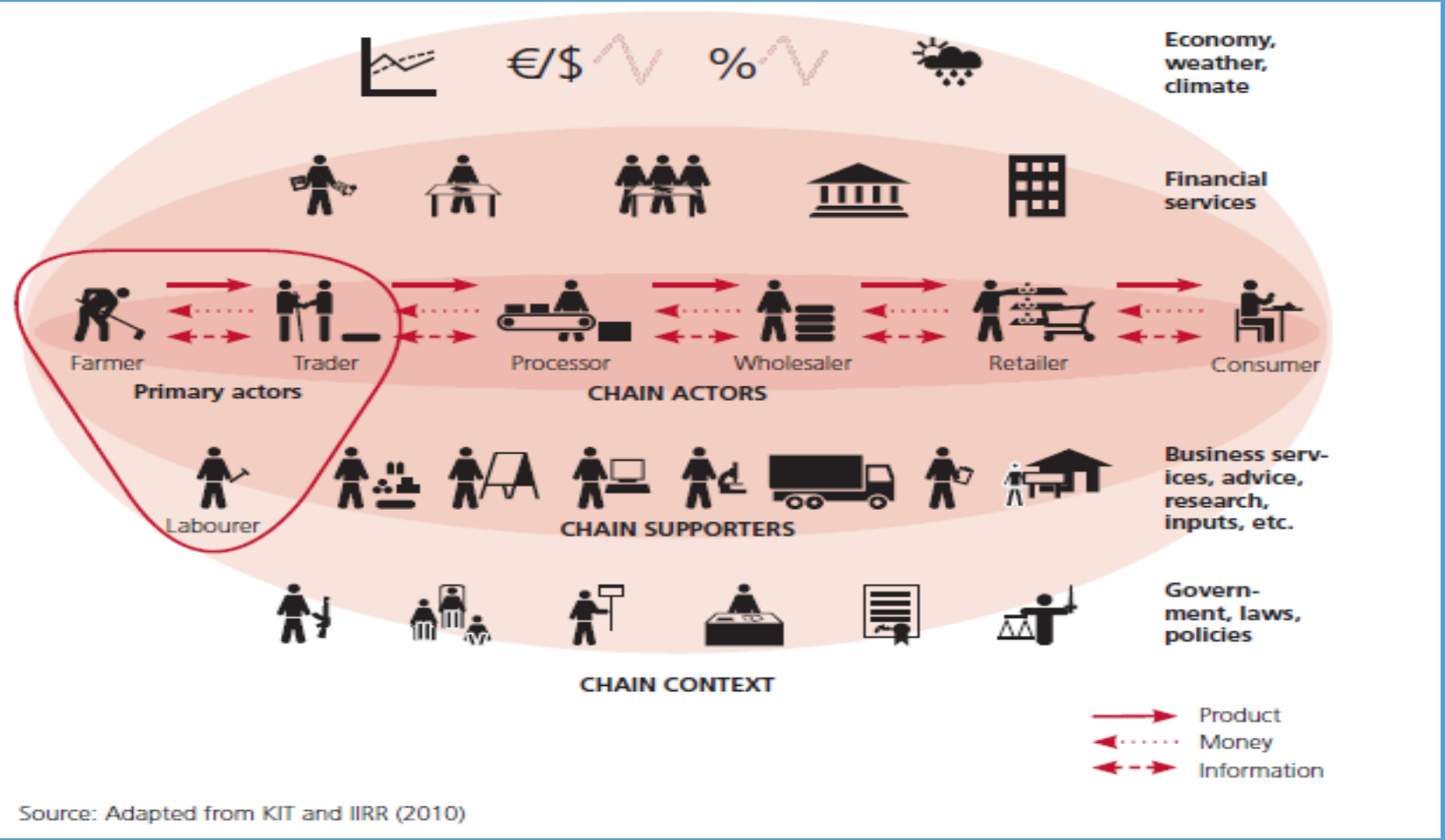
Comparison cont'd

	Diffusion & adoption	FSR	AKIS	AIS
Relation with policy environment	Science is independent – institutional factors as external conditioners of adoption	Science is independent – institutional factors as external conditioners of adoption	Science and technology develop in a historically defined context	Science and technology develop in a historically defined context
Role science	Innovators	Experts	Collaborators	Partners, one of many responding to demands
Role farmers	Adopters/ laggards	Sources of information	Experimenters	Partners, entrepreneurs, innovators exerting demands

Comparison cont'd

	Diffusion & adoption	FSR	AKIS	AIS
Innovators	Scientists	Scientists and extensionists	Farmers, scientists and extensionists	Multiple actors, innovation platforms/ networks
Key changes sought	Farmer's behaviour change	Removing farmers' constraints	Empowering farmers	Broader institutional change, creating innovation capacity
Intended outcomes	Technology adoption/ uptake	Farming system fit	Co-evolved technologies better fitted to livelihood systems	Capacities to co- innovate, learn and change

AIS: consider the full chain and create interaction throughout the chain



Source: Adapted from KIT and IIRR (2010)

AIS can be enabling or constraining: system failures

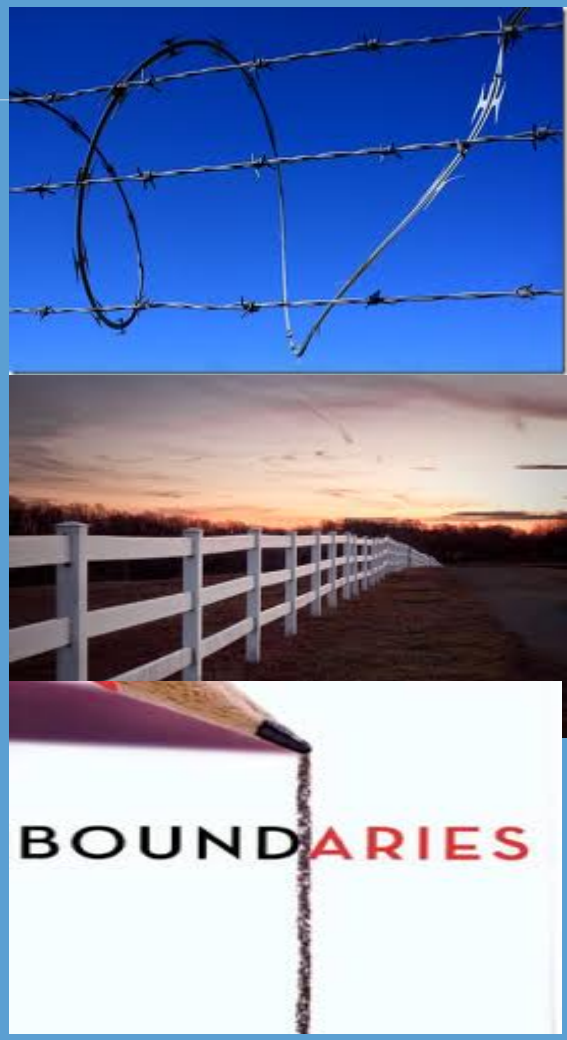
- Infrastructural failures
- Capacity failures
- Network failures:
  - Weak NF: Fragmentation of AIS - limited linkage formation
  - Strong NF: dominant incumbent players – lock-in
- Institutional failures:
  - Hard IF: non-conducive laws, regulations, procedures
  - Soft IF: conflicting values, norms, habits of actors

Some related issues for joint knowledge production and co-innovation

- Differences in:
  - Problem perceptions and framings of solution space
  - Bodies of knowledge (scientific, experiential, etc) and related concepts, definitions
  - Access to different bodies of knowledge
  - Relative acceptance of different bodies of knowledge
  - Incentives and drivers for action

Hence: plenty of boundaries to cross/ bridge

- Science – practice
- Science – policy
- Policy – practice
- Practice – civic society
- Practice – practice (e.g. farmers – retail)
- Science – extension/advisory systems
- Etc.



Boundary/intermediary work: plethora of concepts and terminologies

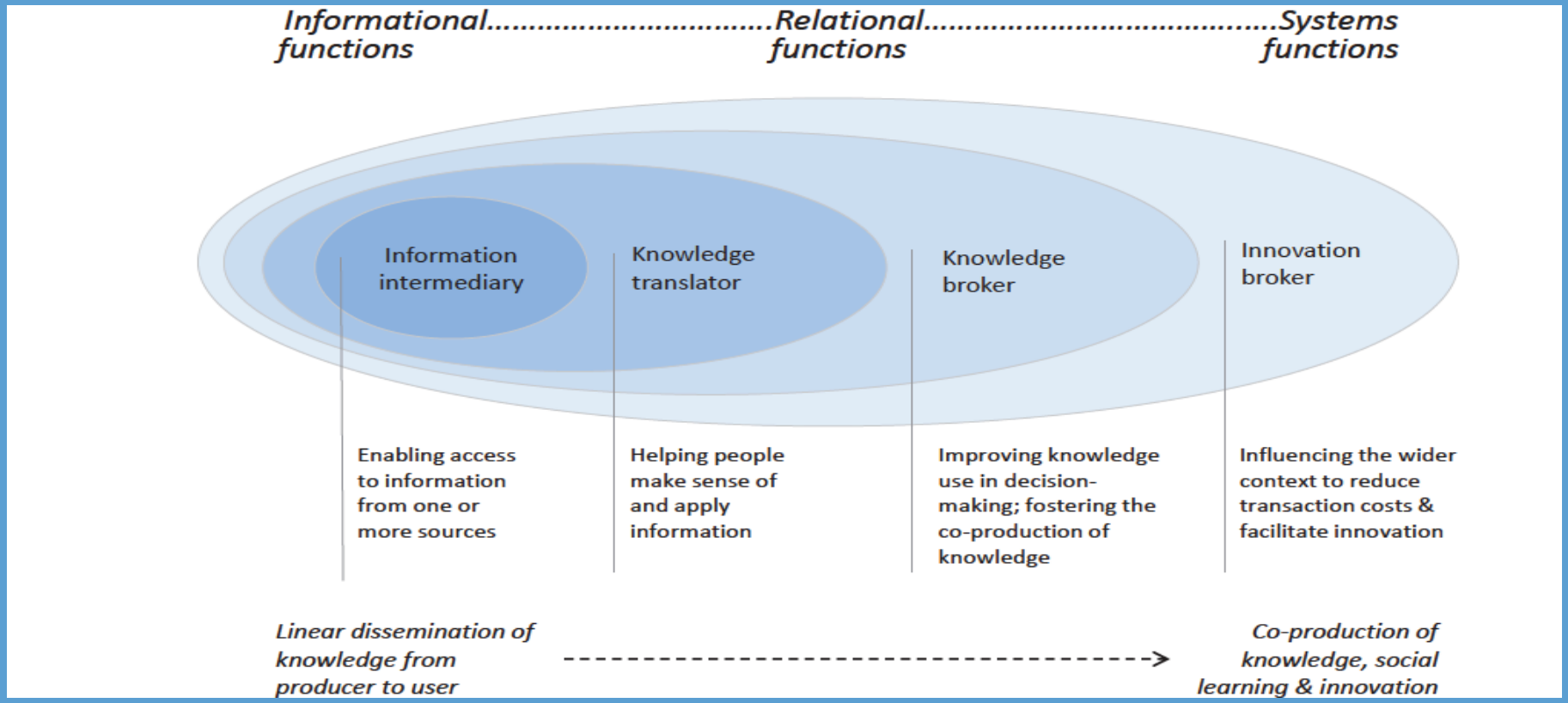
- From science and technology studies and sustainability science: boundary work and boundary organisations
- From management and popular in sectors like medicine: knowledge brokering, knowledge translation, knowledge mobilisation (summarized as K* recently)
- From innovation studies: innovation intermediaries and innovation brokers

Boundary organization

- "Organizations mandated to act as intermediaries between the arenas of science and policy" (Cash et al., 2003)
- Three features:
  1. they involve specialized roles within the organization for managing the boundary
  2. they have clear lines of responsibility and accountability to distinct social arenas on opposite sides of the boundary
  3. they provide a forum in which information can be co-produced by actors from different sides of the boundary through the use of 'boundary objects' and hence fulfill a bridge between different 'worlds'

Knowledge broker

- Knowledge Brokering (KB): a two-way exchange of knowledge about an issue, which fosters collective learning and usually involves knowledge brokers or 'intermediaries'. (Bielak et al., 2012)



Innovation intermediary

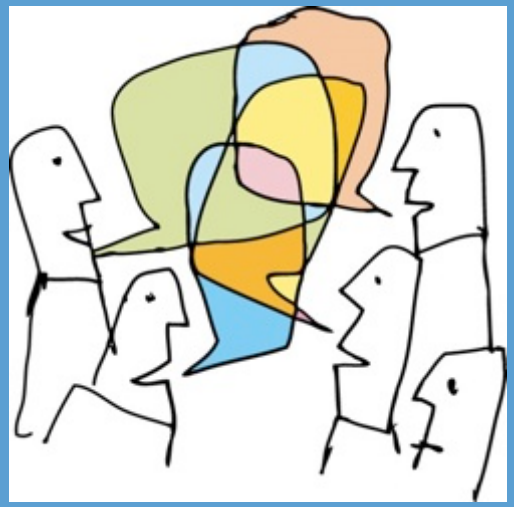
- Howells (2006): "an organisation or body that acts as an agent or broker in any aspect of the innovation process between two or more parties […] helping to provide information about potential collaborators; brokering a transaction between two or more parties; acting as a mediator, or go-between, bodies or organisations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations"
- From intermediary in bilateral relationship to *systemic intermediary*

Specialized innovation network builders: innovation brokers

- Winch & Courtney (2007): "an organisation acting as a member of a network of actors [..] that is focused neither on the organisation nor the implementation of innovations, but on enabling other organisations to innovate"

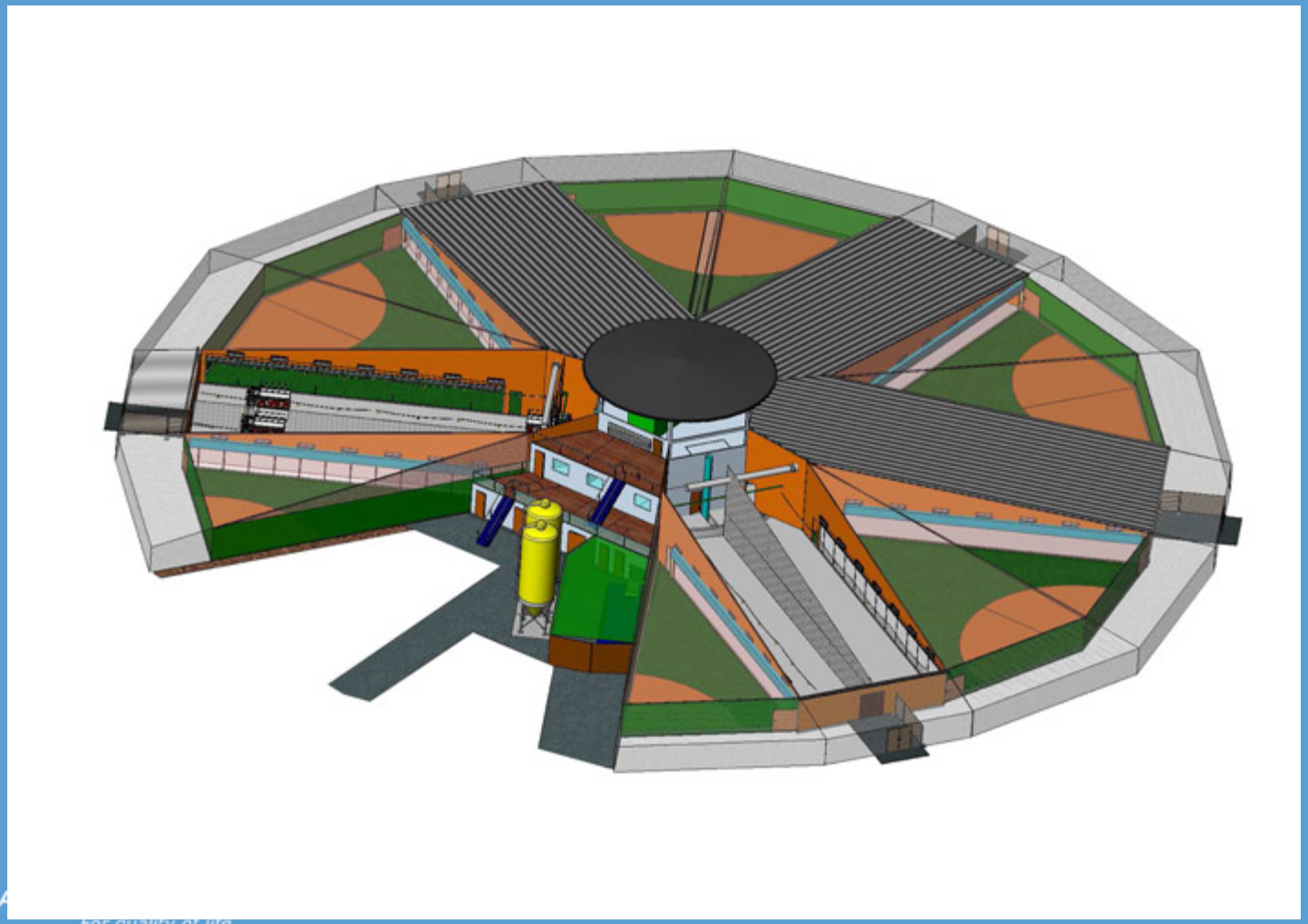
Intermediate conclusion

- Different concepts have a large degree of overlap
- Different considerations for classifying intermediaries/boundary workers:
    - Number of boundaries they work on: single or multiple?
    - Active translation and co-production of knowledge or mainly facilitation so that other can exchange and co-produce knowledge (enabling networks)?
    - As a side activity or a core-function?



So what does bpoundary work/K*/innovation brokering in practice look like?

Radical innovation in egg production: the Rondeel case

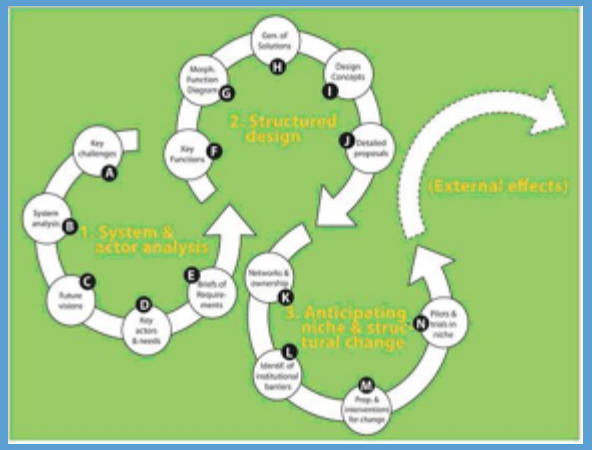


Starting point: crisis in animal production systems

- Low animal welfare
- We import soy and keep the dung
- Contagious disease and multiple resistant bacteria
- Meat consumption and obesity
- Animal production and climate change
- Low protein conversion ratio

Method of 'interactive reflexive design'

- Actual production system and socio-technical regime are 'locked-in'
- Visionaries are invited to think in possibilities, not current problems and constraints
- Surveys among citizens on ideal production system
- Also views farmers , scientists, and hens (through ethological scientists) are integrated
- Briefs of requirements: what needs should the system fulfill?

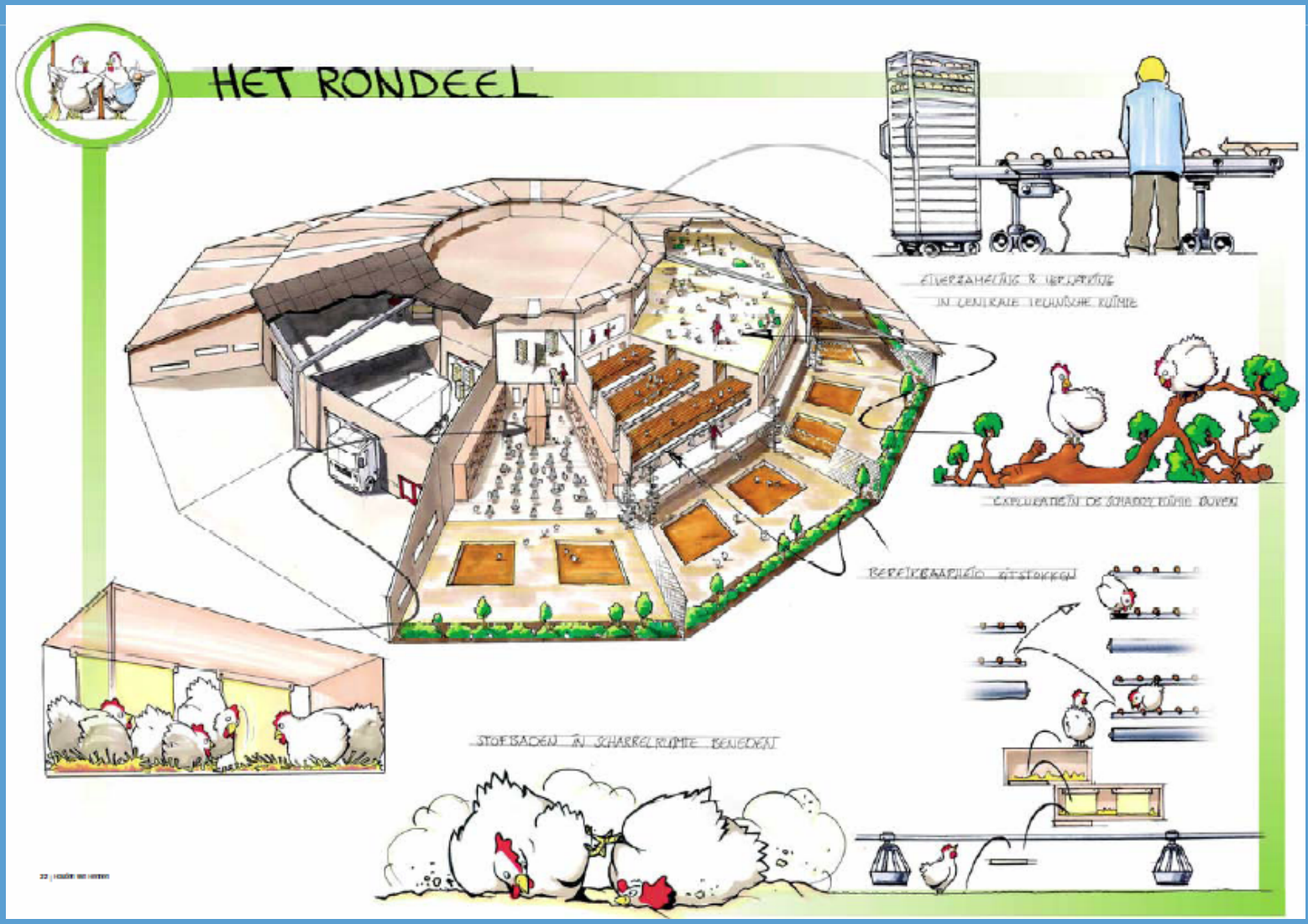


Program of demands

Codering	Behoeften	Specificatie behoeften	Eis	Hoeveelheid	Bron
LR	**Rusten**				
LR1	Uitvoeren van rust- en slaapgedrag	Voldoende rustruimte	Zitruimte per hen	18 cm breedte (afmeting van een gemiddelde hen die zit) of 0,035 * W^0,67 * 10.000 = allometrische formule zittende hen = 538 cm^2 bij een W= 1,9 kg (Baxter)	1. Freeman, 1983, Veterinary Record, 113, 2. Bogner, H., Peschke, V., Seda, V. and Pop in Käfigen bei bestimmten Aktivaten. Berl. M 3. Stamp Dawkins & Hardie (1989) Space ne 4. Appleby, 1998, Poultry Science 77, 1828 medium hybrid laying hens. British Poultry Sc
LR2			Staruimte per hen	15 cm breedte (afmeting van een gemiddelde hen die staat) of 0,029 * W^0,67 * 10.000 = allometrische formule zittende hen = 446 cm^2 bij een W= 1,9 kg (Baxter)	5. Newberry, R.C., Estevez, I. and Keeling, L fowl., Applied Animal Behaviour Science, 73, 6. Savory, C.J., Percival, D., Yuill, I. ,2002, I of laying hens. British Poultry Science, 43, S of houses lifestock. In: Farm animals and the 81.
LR3			Hooggeplaatste zitruimte	-	
LR4			Rustplaats bevindt zich niet op looplijnen naar voer/water of legnest (of andere functiegebieden)	-	
LR5		Eigenschappen zitstok	Optimale hoogte, vorm, kleur, structuur, plaats, zichtbaarheid van de zitstok	-	1. Appleby, 1998, Poultry Science 77, 1828 2. Muiruri et al.,1990 Preferences of hens fo Science, 27, 141-147. 3.Tayer, P.E., Scott, G.B. and Rose, P., 200 perches; effects of light intensity and perch 4. Graham Scott., 1997. The SAC high-welfa 5. Tauson, R. and Abrahamsson, P., 1994. F Agriculturae Scandinavica, Section A - Anima 6. Tauson, R. and Abrahamsson, P., 1996. F Agriculturae Scandinavica, Section A - Anima 7. Lambe, N.R. and Scott, G.B., 1997, Perch among laying hens. Animal Welfare, 7, 203-2
LR6		Dag-nacht ritme	Licht/Donker periodiciteit bieden: natuurlijke schemerperiodes aanbieden	min. 8 uur aaneengesloten donker	1. Prescot, Wathes and Jarvis, 2003. Light, 288. 2. Manser, C.E. (1996). Effects of lighting on 5, 341-360.

WAGENINGEN UR
For quality of life

Artist impressions



Nice designs – but what next?

Some firms took up the challenge: consortium

Vencomatic

Kwetters

Eieren, Eggs, Eier, Oeufs, Huevos

Designs gave guidance, but these firms still had many uncertainties

- On technological development
- On resources needed
- On public policies
- On consumer behaviour
- On supplier behaviour
- On retailers behaviour

Internal and external capacities

- Vencomatic and Kwetters have well qualified staff that could help some of these uncertainties (e.g. on marketing, technology)
- But also need for external resources and comptences
  - External consultancy (in CSR, technology, market, business model) – look for and verify options
  - To make contacts in different 'worlds' – government, retail, NGOs
  - To get to know other similar experiences and creative solutions
  - To find and obtain capital

External capacities

- Livestock Research: R&D and brokering
- Transition and Society: CSR consultancy, process facilitation and brokering
- TransForum: brokering, funding, process facilitation and monitoring

LIVESTOCK RESEARCH
WAGENINGEN UR

TRANSFORUM
AGRO&GROEN

Also visualization design helped to ‘sell the story’

- Towards local authorities
- Towards the national government
- Towards farmer’s organization
- Towards Animal Protection Society
- Towards supermarkets
- Towards farmers

Beter Leven ★★★ Dierenbescherming

WAGENINGEN UR
For quality of life

Different components of innovation are interdependent

- To sell egg: need to have system built and operational
- For funding: guaranteed retail purchases needed
- No construction: no purchases from retail
- No promise of purchase of retail: no funding
- Vicious cycle: who comes with the money?

How to get a guarantee?

- Vencomatic as SME can invest, but not bear all risks
- Innovation subsidies are insufficient
- Banks do not lend for uncertain innovations
- But state support also has its limits
- Continuous lobby and opportunity searching needed

Guarantee paved the way

- Bank gave loan
- Construction of first Rondeel

Guarantee paved the way

Guarantee paved the way

- Construction first Rondeel enabled having serous negotiations with supermarkets for shelve space
- Eggs sold under private label ‘AH Pure and Honest’
- NGO’s enthousiastic – free publicity

Key role of innovation brokering/K*/ boundary work

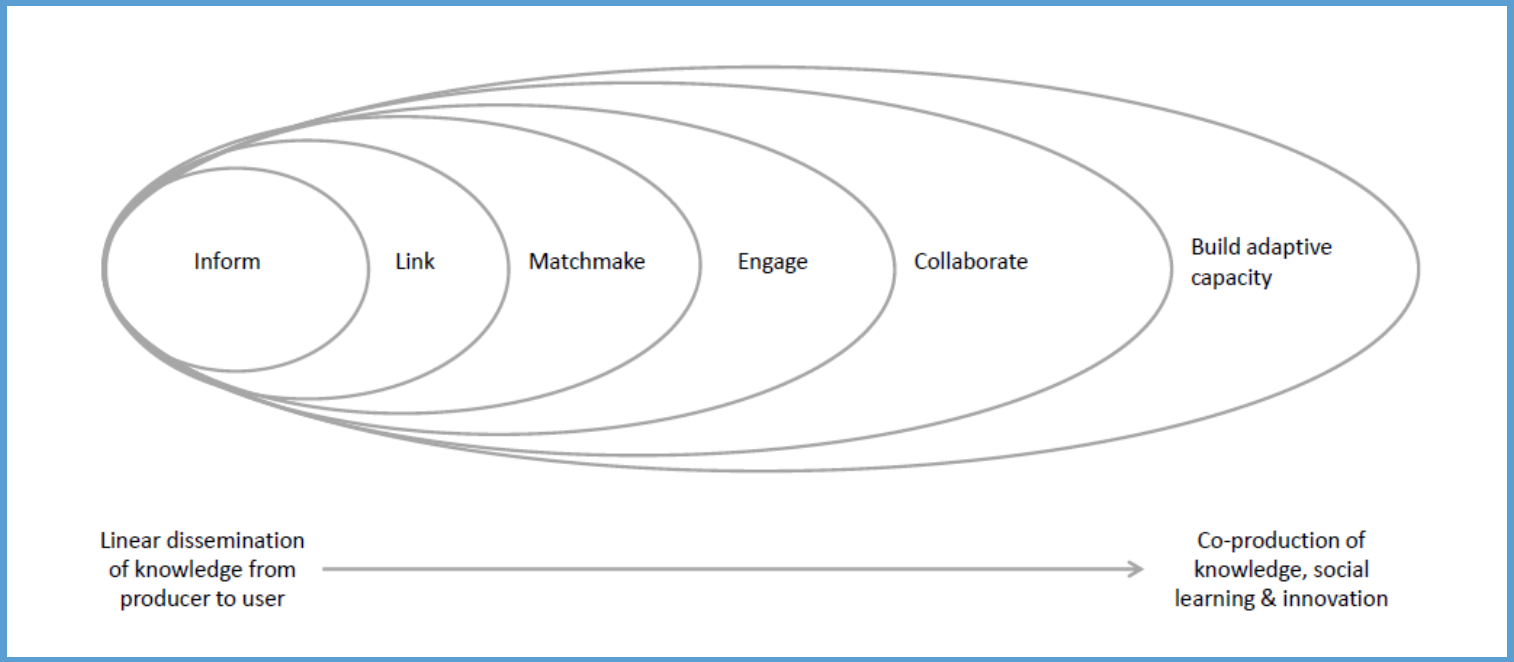
- Building strong but adaptive vision
- Building interfaces – spanning boundaries and mediating
- Mobilizing powerful and influential advocates
- Giving R&D inputs when needed
- Reflexive process monitoring

WAGENINGEN UR
For quality of life

Innovation brokering/ K*/ boundary work: issues and implications

Boundary work/K*/innovation brokering in processes

- Needs to connect to a 'dynamic learning agenda'
- Depending on the level of complexity, uncertainty and unpredictability, different boundary arrangements need to be chosen

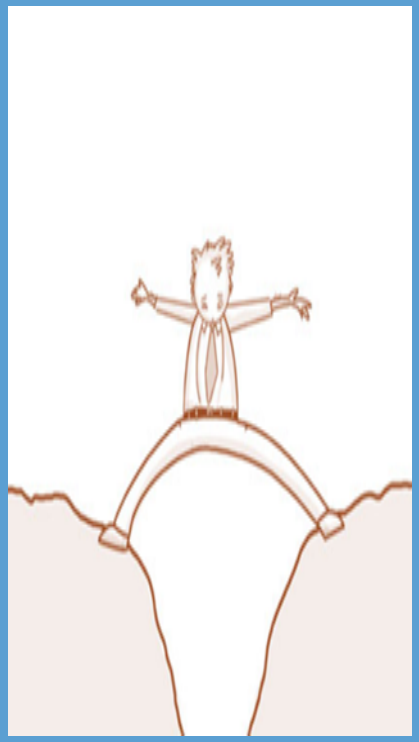


Some issues with positioning boundary work/K*/innovation brokering

- Positioning dilemmas in processes:
  - Distanced or engaged role?
  - 'Neutral' or normative position?
  - Expert or jack-of-all trades?
  - Moments and duration of involvement

Implications for roles in AKIS: extension

- Extension has been described as 'boundary organization' by Cash.
- From information intermediary (science ->practice) to knowledge broker (between multiple bodies of knowledge), more emphasis on two-way communication (using different advisory repertoires)
- Given pluralism of current extension (or advisory) systems and complex queries of clients, need to consider 'networks of advisors'
- Boundary work/intermediation between the science system and the extension/advisory system



Implications for roles in AKIS: boundary arrangements for research (Schut et al.)

Boundary arrangement	Description
Independent research	Research is independent of stakeholder or political interests. Research is not concerned with how research findings are mobilised and used.
Research steers stakeholder	Research actively seeks to persuade stakeholders to select a specific solution for the problem.
Informative relationship	Dissemination of information on policy content and process. Research and stakeholders inform one another in a supply-oriented fashion.
Advisory relationship	Research and stakeholders operate in their own separate domains, but research provides advice to stakeholders, and stakeholder can advise research about the relevance of research questions.
Exchange relationship	Research acknowledges that stakeholders have specific needs and questions, and proactively seeks to reconcile demand and supply. Research and stakeholders interact on research demands and exchange information.

Implications for roles in AKIS: boundary arrangements for research (Schut et al.)

Boundary arrangement	Description
Co-learning relationship	Co-production of research. Researchers and stakeholders engage in a joint learning relationship to produce stakeholder-relevant research.
Capacity building relationship	Research builds capacity and seeks to strengthen the position and capacity/ skills of the stakeholder in the policy process.
Selective use of research	Research is used opportunistically, selectively and strategically by stakeholders to defend their interests and pursue their goals.
Stakeholders steer research	Stakeholders influence and determine research agenda setting, how the research is conducted and/or used.

Some issues with positioning boundary work/brokering in AKIS

- Recognition of new/expanded roles for research and extension towards boundary work is sometimes still problematic:
  - Other job perception & skill set needed (not only expert role)
  - Other evaluation criteria needed (not just publications)
  - Intangibility of much of the work
  - Role demarcation and ambiguities: who does what?

Implications for roles in AKIS: innovation brokers/managers as a new 'pillar' (in addition to research & extension)?

- Primarily concerned with enabling connections and making them work
- Main tasks:
  - Vision building and demand/supply articulation
  - network formation
  - innovation process management (i.e. network facilitation, reflexive monitoring)
- Enabling boundary workers (extension and research) having translational functions

WAGENINGEN UR
For quality of life

Thank you for your attention!