

Recent Trends Influencing Agricultural Innovation Systems: Implications for the Science of KTT in Agri-Food

Laurens Klerkx – Knowledge, Technology and Innovation Group - Wageningen University

Ontario Agri-Food Innovation Alliance Knowledge Exchange Event: Advancing the Science of KTT in Agri-Food

28 October 2020

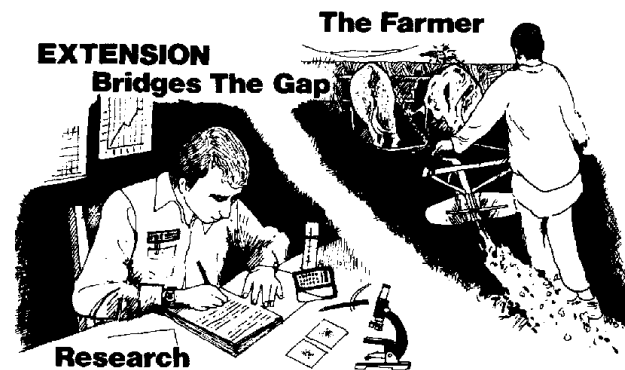


KTT as defined by OMAFRA

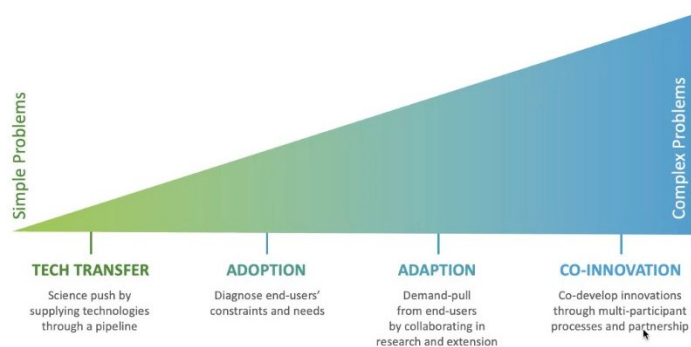
- From OMAFRA's website:
 - "KTT stands for Knowledge Translation and Transfer. At OMAFRA, it is defined as the transformation of knowledge into use through synthesis, exchange, dissemination, dialogue, collaboration and brokering among researchers and research user"
- In this presentation I will focus on the 'program' rather than the 'policy' or 'commercialization' impact stream:
 - "Program - Research that is used in traditional agricultural extension and technology transfer processes to alter programs. Includes audiences through the entire value chain."
- Main objective of this talk is to show changing context and emerging questions for the 'science of extension/KTT'

Current understanding of extension/KTT

- Broad range of advisory, facilitation and intermediation roles (innovation support services)
- Provided by public, private, farmer organization and NGO actors
- Provided as a core business or as part of a broader package of goods and services
- Embedded in agricultural (knowledge and) innovation systems – AIS or AKIS
- Focused on agriculture, but also rural communities and urban areas



Cultivate KTT Team Capacity



Consolidated streams of work in recent years

- Extension/KTT system development, performance and inclusion, public/private/collective roles
- Documentation of a wide range of (new) intermediary roles fulfilled by extension/KTT services
- Continuous attention to development of methodologies, tools, pedagogy
- Critical studies on role advisory services within policy and practice
- Behaviour change and adoption continue on the agenda



Pluralism of agricultural advisory service providers – Facts and insights from Europe

Andrea Knierim ^{a, b, R, E}, Pierre Labarthe ^c, Catherine Laurent ^c, Katrin Prager ^d, Jozef Kania ^e, Livia Madureira ^f, Tim Hyacynth Ndah ^{a, b}



Expertise in rural development: A conceptual and empirical analysis

Philip Lowe ^E, Jeremy Phillipson ^{R, E}, Amy Proctor ^E, Menelaos Gkartzios ^E

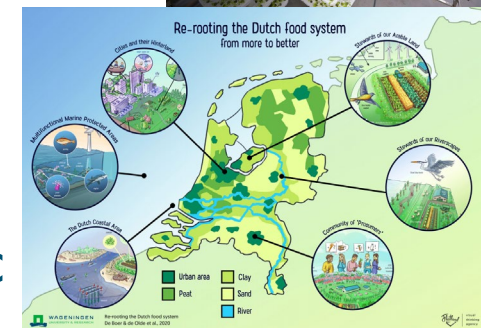
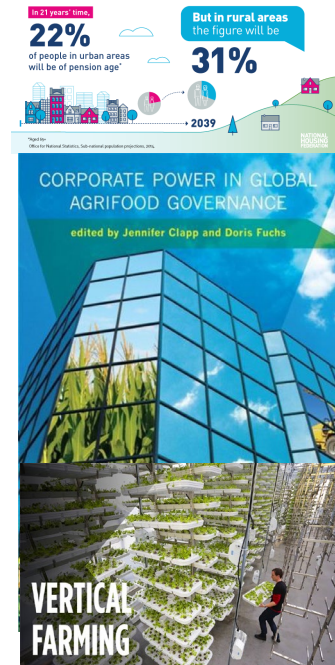


Extension 3.0: Managing Agricultural Knowledge Systems in the Network Age

Mark Lubell, Meredith Niles & Matthew Hoffman

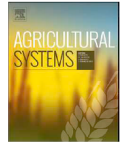
Several major challenges, developments and trends are influencing agriculture

- Growing demand for food, fibre and energy
- Climate change, resource degradation, biodiversity loss
- More critical consumers, social justice issues
- Rural population changes - farm succession + new entrants
- Corporatization of agriculture versus family (smallholder) farms, specialization vs multifunctionality
- Shift towards food systems approach and new technologies and perspectives coming in (vertical, circular, regenerative, digital, synthetic



Transformation and disruption

- Transition and transformation of food systems are key pillars of policy agendas worldwide
- Different drivers: both natural, economic, and technological
- Some of these have a (potentially) disruptive nature
- May affect both agriculture and extension/KTT 'regimes'



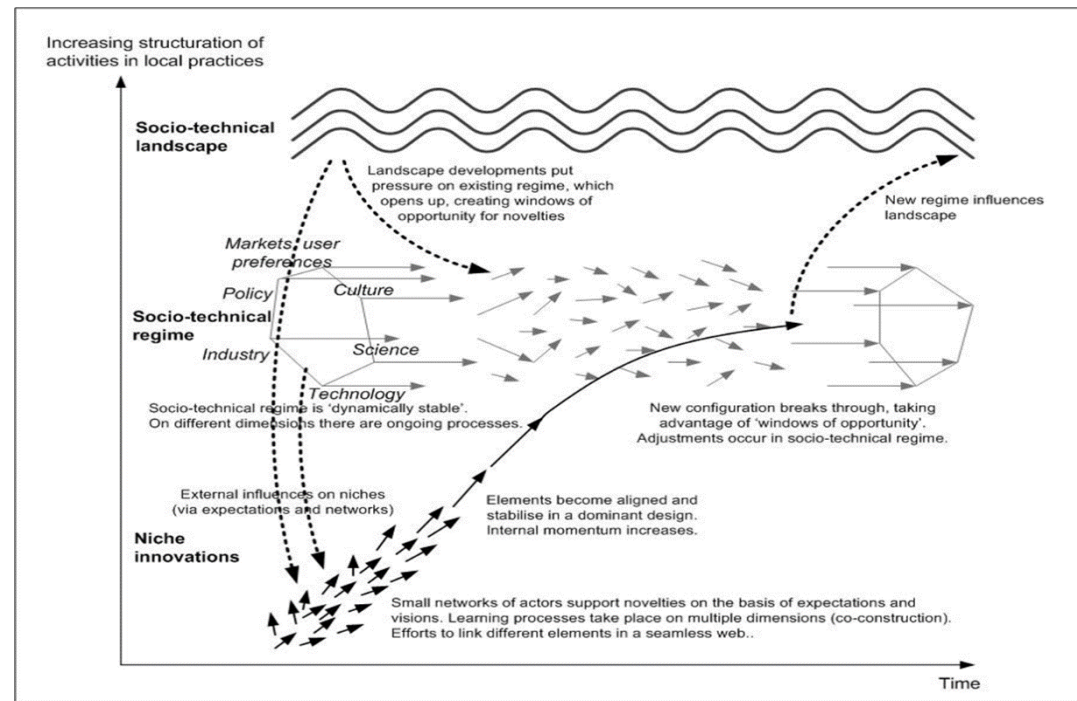
Perspectives

Supporting food systems transformation: The what, why, who, where and how of mission-oriented agricultural innovation systems



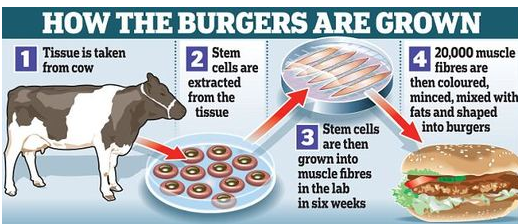
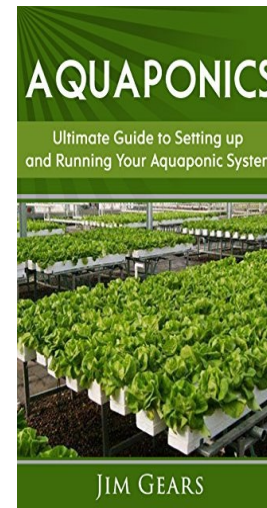
Laurens Klerkx*, Stephanie Begemann

Knowledge, Technology and Innovation Group, Wageningen University, the Netherlands



Plurality of visions and missions

- Transformation and disruption are not value free and have (competing/collaborating/co-existing) networks of actors and underlying values, visions and paradigms: *sustainable intensification, ecological intensification, agriculture 4.0, etc., etc., etc.*
- So there are different 'missions' towards transformation

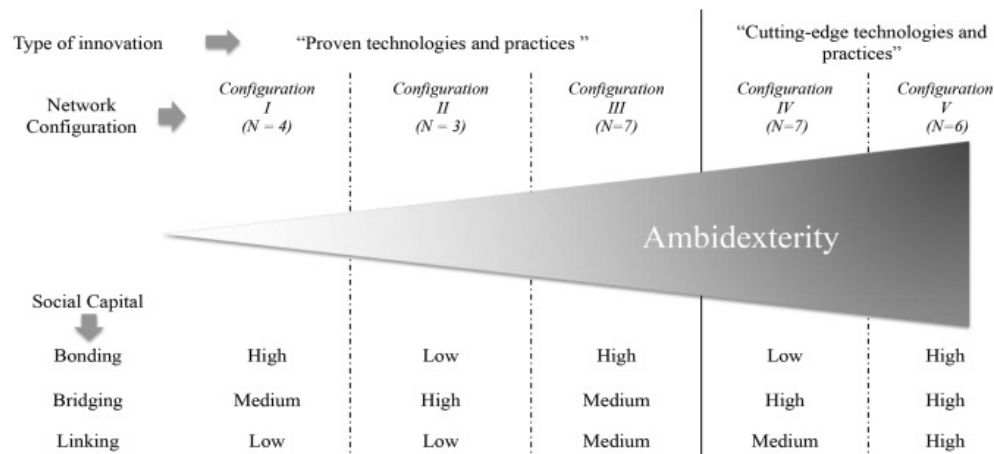


What do future(s) of agriculture imply for the extension/KTT research agenda?



Diversity in extension/KTT networks

- Depending on farming style/orientation & transition pathway, great diversity in extension/KTT networks (or 'KTT teams')



JOURNAL OF AGRICULTURAL EDUCATION AND EXTENSION, 2017
<https://doi.org/10.1080/1389224X.2017.1320640>



ORIGINAL ARTICLE

OPEN ACCESS [Check for updates](#)

Achieving best-fit configurations through advisory subsystems in AKIS: case studies of advisory service provisioning for diverse types of farmers in Norway

Laurens Klerkx^a, Egil Petter Stræte^b, Gunn-Turid Kvam^b, Eystein Ystad^c and Renate Marie Butli Hårstad^b



Journal of Rural Studies 69 (2019) 53–64



Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud



Combinations of bonding, bridging, and linking social capital for farm innovation: How farmers configure different support networks

Gabriela Cofré-Bravo^a, Laurens Klerkx^b, Alejandra Engler^{a,c,*}



Article

The distributed farmer: rethinking US Midwestern precision agriculture techniques

Matt Comi

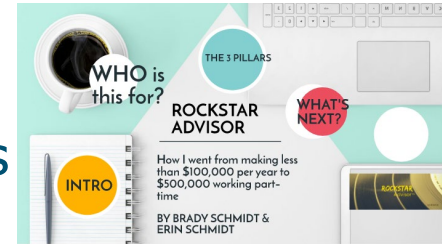
Received 17 Nov 2019, Accepted 07 Jul 2020, Published online: 29 Jul 2020

[Download citation](#) <https://doi.org/10.1080/23251042.2020.1794426>

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Understanding diversity and extension/KTT

- Need for understanding better:
 - Advice consumption styles: reasons for choosing independent advisors, agribusiness, 'one-stop-shop', etc. – strategic combinations
 - How advisors switch between advisory styles
 - 'Average' and 'rockstar advisors': how reputation is built
 - Advisory synergies and 'advisory bubbles': advantages and risks of closed networks
 - How different advisory networks/KTT teams engage with different 'back-offices'
 - Age/experience/gender composition of advisory organisations and collegial & generational interaction



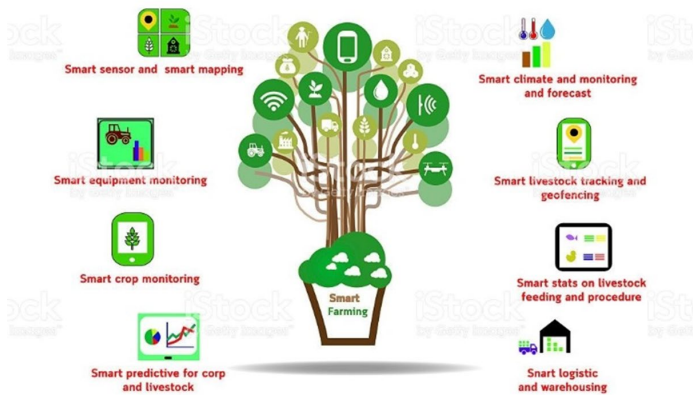
Extension/KTT in connection with transition pathways/missions

- Looking at questions such as:
 - How do advisory/KTT systems respond to and connect to different transition pathways/missions?
 - How do 'grassroots advisory movements' develop?
 - How are value dilemmas managed?
 - What shapes the "politics of policy attention" to different transition pathways (niche AKIS/ regime AKIS)?
 - How are (dis)continuities managed in the advisory profession?



Understanding (potential) disruption and extension/KTT

- Digitalization, circularity, synthetization, urbanization

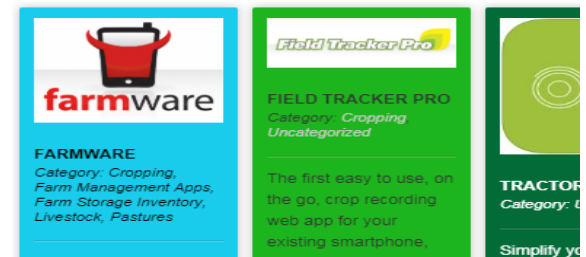


Emerging work: Digital extension/KTT

- Macro-level: e.g. work on Digital Agricultural Innovation Systems
- Meso-level: e.g. work on farmer-advisor interaction, apps, social media
- Micro-level: cyber-physical-social-ecological systems



Show all Blog Cropping Farm Management Utilities



NJAS - Wageningen Journal of Life Sciences 90-91 (2019) 100315



Review

A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda

Laurens Klerkx^{a,*}, Emma Jakku^b, Pierre Labarthe^c

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Understanding digitalization and extension

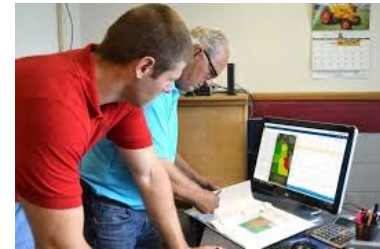
■ Questions such as:

- How do extension providers adjust? Start-ups, new business models?
- New advisory alliances for cross-sectoral systems and emerging issues (e.g. data cooperatives)?
- Interaction data-farmer- advisor, the rise of the 'augmented advisor', virtual advisory encounters?
- Data science on extension
- Advisory platform technologies?



The 'eco-material side' of extension/KTT

- Different farming styles and transition pathways have different and new (im)material contexts
- Sometime also 'hybrid' material contexts (e.g. agroecology + digital)
- Raises question such as:
 - How do farmers and advisors engage with these hybrid material contexts?
 - How does it affect their advisory encounters?
 - What does it imply for tool affordances and method design?
 - What does it imply for advisor training?
 - The influence of data vs. the human advisor in advisory encounters?



The human/organisational side of farming and extension/KTT

- Financialization, scale increase, disruptive technologies, migrant labour, multifunctionality etc. impact on the farmer and workers
- Questions:
 - How does extension deal with finance, worker management, succession planning?
 - How does extension engage with the human side of farming, e.g. joy, stress and mental health issues? What does this mean for the professional profile?



Money talk: How relations between farmers and advisors around financial management are shaped

Aniek Hilken^{a,*}, Janet I. Reid^b, Laurens Klerkx^b, David I. Gray^c



Agronomy for Sustainable Development (2019) 39: 2
<https://doi.org/10.1007/s13593-018-0547-x>

REVIEW ARTICLE

Advice and advisory roles about work on farms. A review

Anne-Charlotte Dockès¹ · Sophie Chauvat² · Pastora Correa³ · Amélie Turlot⁴ · Ruth Nettle⁵

Exp. Agric.: page 1 of 15 © Cambridge University Press 2018. This is an Open Access article, distributed under the terms of the Creative Commons Attribution licence (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

doi:10.1017/S0014479718000315

CONSIDERING THE FARM WORKFORCE AS PART OF FARMERS' INNOVATIVE BEHAVIOUR: A KEY FACTOR IN INCLUSIVE ON-FARM PROCESSES OF TECHNOLOGY AND PRACTICE ADOPTION

By GABRIELA COFRE-BRAVO[†], ALEJANDRA ENGLER^{†‡§},
LAURENS KLERKX[¶], MARCELO LEIVA-BIANCHI^{††},
CRISTIAN ADASME-BERRIOS^{††} and CRISTIAN CACERES^{††}

The international dimension of extension?KTT

- Internationalization of extension in view of global transition pathways
- Global flow of extension models versus context specificity
- Global social media networks
- Questions such as:
 - How do (formal and informal) advisors operate cross-culturally?
 - What adaptation dynamics (do not) take place? In terms of technologies and methodologies?



Dynamics and distribution of public and private research and extension roles for technological innovation and diffusion: Case studies of the implementation and adaptation of precision farming technologies

C. Eastwood ^{a,b,*}, L. Klerkx ^c, R. Nettle ^a



Education and training

- Renewed attention to advisor/KTT training and learning. Emerging questions:
 - Digital natives and advisory services: what does it imply for training next generation advisors/KTT?
 - What about advisory ethics in view of diversity and power dynamics?
 - How do social and natural science graduates and different sorts students at technical schools perceive and enact transition pathways?

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Which theories can be of use?

- Extension/KTT science has always been pluralist in terms of theories (psychology, sociology, economics, etc.)
- Expanding the toolbox, a few possibilities:
 - Practice theories
 - Organization studies: organizational identity
 - ANT and assemblage theory: actors and actants, socio-material flows
 - STS: innovation cultures
 - Economics and management: e.g. digital business model theory
 - Social network analysis

Does this 'science of extension/KTT' have any practical and policy relevance?

- Informing adjustments in KTT/advisor training (initial and continuous)
- Supporting KTT/extension organizations to make sense of change dynamics
- Highlighting inclusion and exclusion effects and what that means for KTT/extension
- Counteracting power imbalances in KTT/extension systems
- Taking into account the diversity of KTT/extension 'missions' in policy targeting



Our vision

Our renewed vision: To invest in the knowledge, data and innovation necessary to:

- Achieve assurance in food safety;
- Protect animal, plant and public health and the environment;
- Grow Ontario's capacity to produce food; and
- Support a globally and domestically competitive agri-food sector

Thanks for your attention!

See also



The Journal of Agricultural Education and Extension Competence for Rural Innovation and Transformation



ISSN: 1389-224X (Print) 1750-8622 (Online) Journal homepage: <https://www.tandfonline.com/loi/raee20>

**Advisory services and transformation, plurality
and disruption of agriculture and food systems:
towards a new research agenda for agricultural
education and extension studies**

Laurens Klerkx