



Co-designing crop diversification strategies from plot to sociotechnical system to manage root-knot nematodes in Mediterranean market gardening systems

Yann Boulestreau (INRA Ecodeveloppement, ADEME)

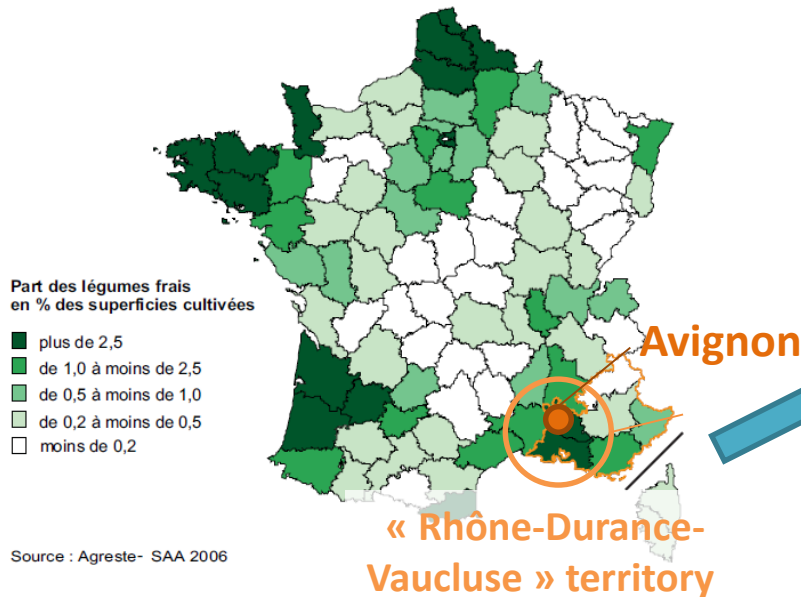
Marion Casagrande (ITAB, INRA Ecodeveloppement)

Mireille Navarrete (INRA Ecodeveloppement)

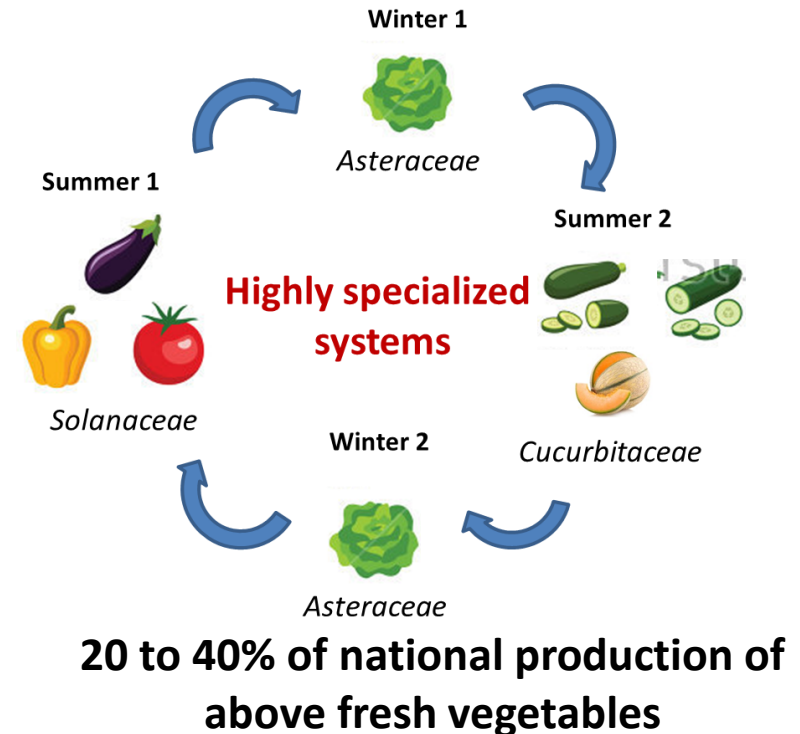
Contact: yann.boulestreau@inra.fr

« Rhône-Durance-Vaucluse » territory : a specialized vegetable production bassin

Share of fresh vegetable in departemental arable surface



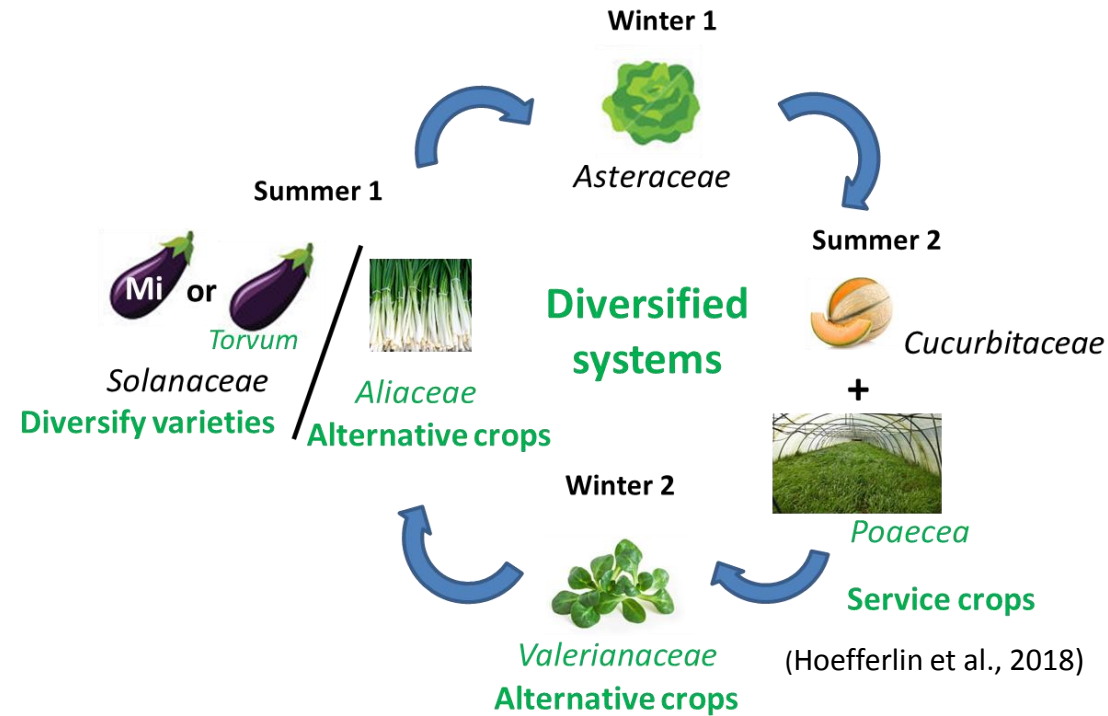
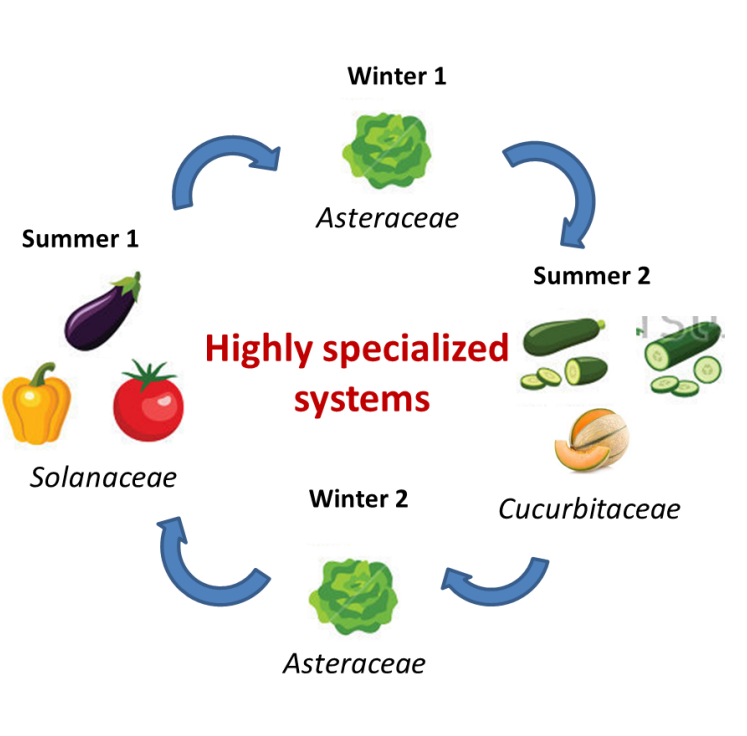
~1/3 of French sheltered vegetable production involved mostly in long value chains



Soil-borne pest and diseases

Ex: 40% farms with root-knot nematodes issues
(Djian-Caporalino, 2010)

« Rhône-Durance-Vaucluse » territory : a specialized vegetable production bassin



Soil-borne pest and diseases

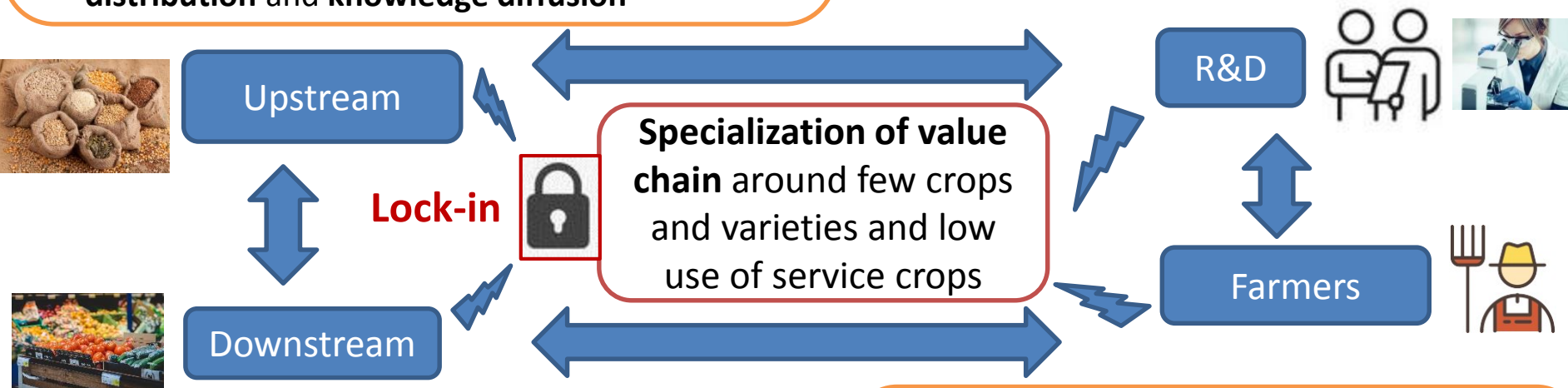
Sociotechnical lock-in around crop specialization in conventional sector

(Geels, 2004)

Context : highly competitive, low market prices, small farming sector (low investments)

- Historical **large investments in few vulnerable varieties of main crops** and chemical fumigation
- **Low investments in service crops and resistant commercial varieties**
- Little diversity in **development, production, distribution and knowledge diffusion**

- Historical **large investments in optimizing specialized cropping systems**
- **Low investments in diversified systems management**



- Require **big volumes of few varieties** with **standard quality** (scale economy)
- Fitting **low market prices**
- Fitting **consumers specialized demand**

- **No space and time** for crop diversification
- **Lack of knowledge** on diversified crops with **low willingness to pay** for it
- **Lack of equipments**
- Fear of **collective action**

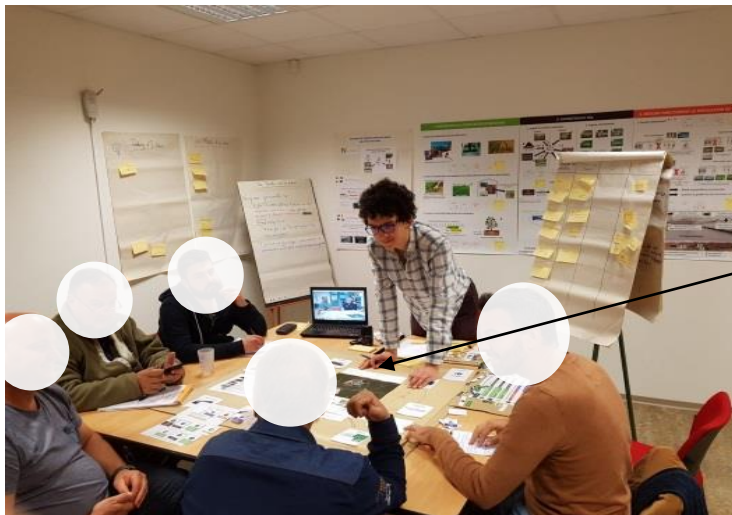
Co-designing strategies from plot to sociotechnical system

Co-designing “coupled innovations” is needed

(Meynard et al., 2017 ; 2018)

1- Farmers workshops (x2) (see Boulestreau et al., 2019)

- **Farmers** = 1st actors to involve (5-6 participants)
- 1- **Knowledge phase**: discussion on agroecological RKN management techniques and impediments encountered on farms (1h30)
- 2- Exploration of **farm-centered strategies** to manage agroecologically RKN (1h30)

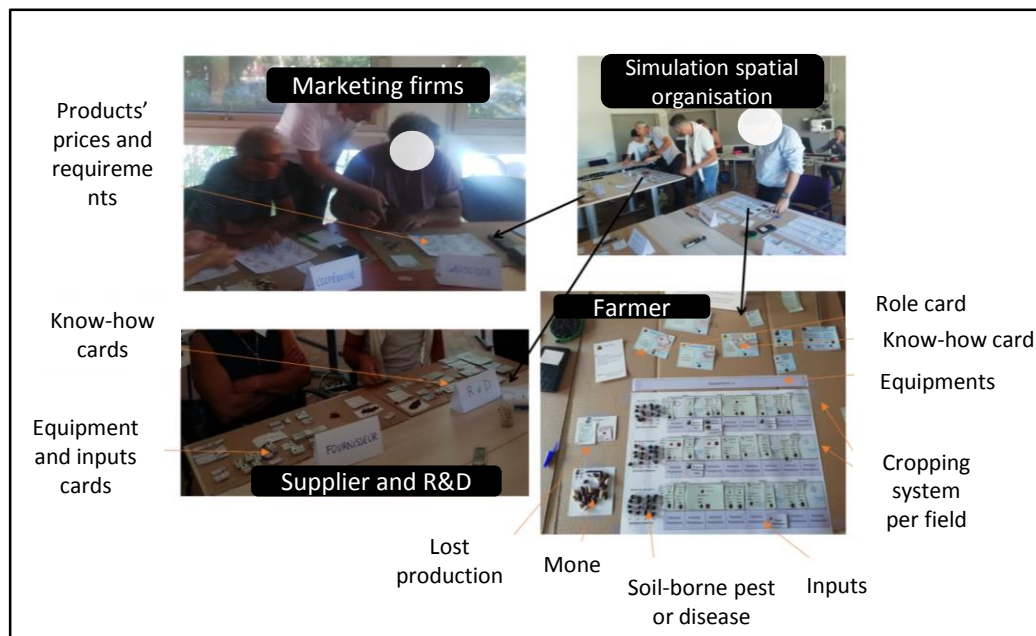


Representation of one of the farmer's farm

Co-designing strategies from plot to sociotechnical system

2- Sociotechnical system (STS) workshops (x2)

- Participative simulation (2h)
 - For sharing the lock-in analysis
 - For making stakeholders work together and be creative
- Explore STS level strategies to enable the agroecological management of the RKN (2h)



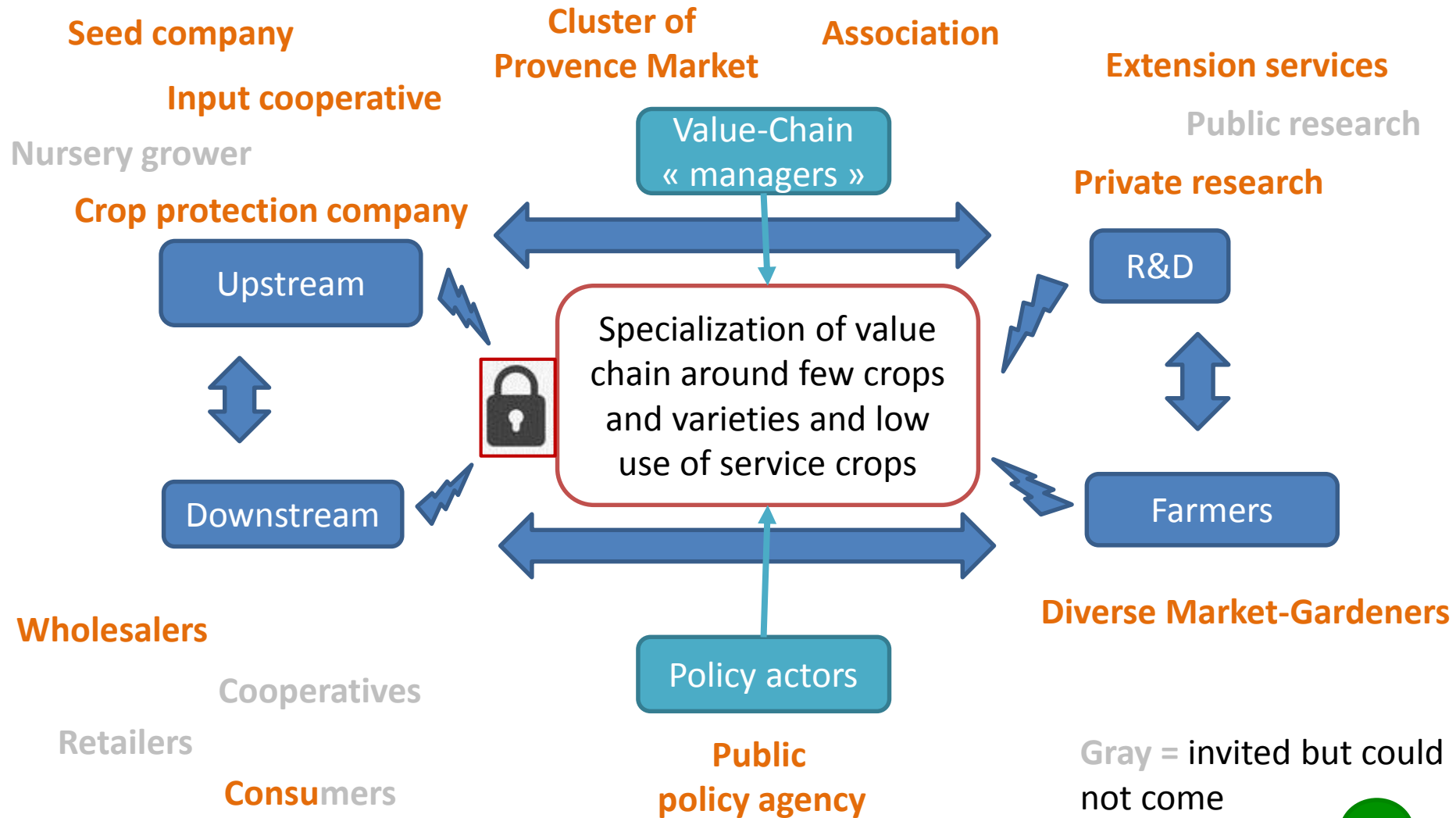
Participative simulation



Strategy exploration debriefing

3- Finalization of strategy exploration in a last workshop (Beginning 2020)

Co-designing strategies – Which actor involved ?(Workshop 2)



Strategies concept designed with stakeholders

- Strategies based **farm-level leeways within dominant sociotechnical regime** (Wksp 1)



Using short value chain



Valuing unused space

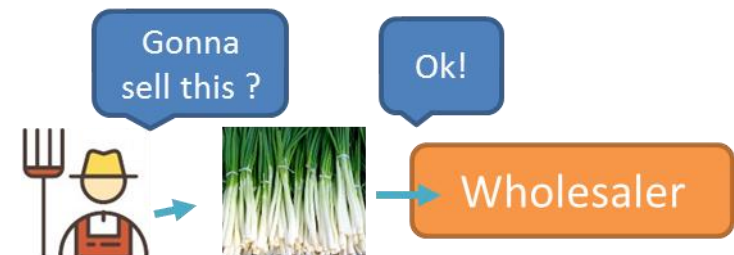
- Strategies at STS level (Wksp 2)
 - Between few actors **within dominant sociotechnical regime**



Exchanging plots



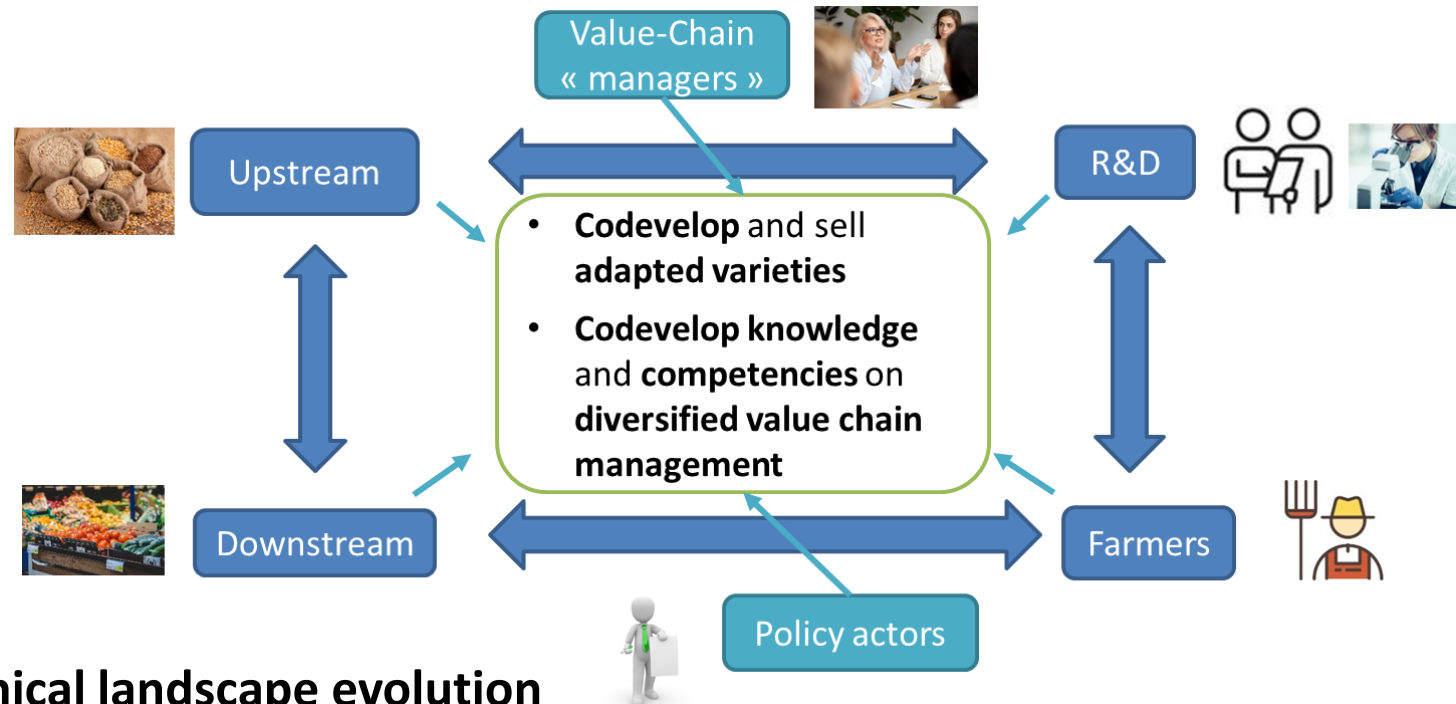
Pooling equipments



Opening new reference

Strategies concept designed with stakeholders

- Strategies at STS level (Wksp 2)
 - Between most actors for **dominant sociotechnical regime transition**



Change food habits

Discussion



Strategies are mostly cooperation-based → how to foster it ?



Organic systems are not as locked as conventional from downstream and R&D : inspiration source ?



From strategies' « Concepts » to « Projects » : precisising and evaluating



Crop diversification need to be combined with other levers to implement agroecological soil management

Thanks for your attention !



Questions ?

References

Poster

- Boulestreau, Y., Casagrande, M., Navarrete, M., 2019. Poster. Quand les professionnels du maraîchage construisent des stratégies de gestion agroécologique des ravageurs ... en jouant ! Colloque Jeux et Enjeux. 14-15 Mai 2019. Marseilles.

Articles

- Djian-Caporalino, C., 2010. Nématodes à galles, des ravageurs de plus en plus préoccupants: Résultats de trois ans d'enquêtes dans quinze régions françaises. PHYTOMA - La Défense des Végétaux (638), 43–49.
- Geels, F.W., 2004. From sectoral systems of innovation to socio-technical systems. adoption or mise en oeuvre of innovation. Research Policy 33 (6-7), 897–920. 10.1016/j.respol.2004.01.015.
- Hoefflerlin, P., Djian-Caporalino, C., Villeneuve, F., Delporte, M., 2018. Les nématodes à galles : Meloidogynes spp. Infos-Ctifl, 24 pp.
- Meynard, J.-M., Charrier, F., Le Bail, M., Magrini, M.-B., Charlier, A., Messéan, A., 2018. Socio-technical lock-in hinders crop diversification in France. Agron. Sustain. Dev. 38 (5), 54.
- Meynard, J.-M., Jeuffroy, M.-H., Le Bail, M., Lefèvre, A., Magrini, M.-B., Michon, C., 2017. Designing coupled innovations for the sustainability transition of agrifood systems. Agricultural Systems 157, 330–339. 10.1016/j.agsy.2016.08.002.

Illustration

- <http://www.lafranceagricole.fr/article/cuma-une-superstructure-departementale-1,0,26518363.html>
- <https://www.news.com.au/lifestyle/food/excuses-for-bad-eating-habits-busted-as-myths/news-story/2e46cd735261980da08dee3e1cf34d36>