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Everywhere the same? Competitiveness of two regional vegetable production clusters in Southern Germany

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Table S1. Detailed overview: assessment of determinants of production clusters Garlic Country and open-field production Lower Bavaria.

Determinants	Garlic Country	Det. ass.[1]	Overall ass.[2]	Open-field production Lower Bavaria	Det. ass.[1]	Overall ass.[2]
			1. Factor conditions			
Climate, Location	**High degree of competition for land (--);** but less vulnerable to climate change (protected production) (+)	**-2**	Restricted	**Moderate land prices (++); but vulnerable to climate change (dry periods) (-)**	**+1**	Very satisfactory
Well-trained workforce	**Lack of highly skilled workforce**	**-2**		Low demand for full-time workers (in addition to seasonal workers); proximity to conventional arable farming increases potential on the labor market	+1	
Infrastructure	Metropolitan region, optimal transport links	+1		Central collection warehouses and local processing industry; proximity to international markets (Austria, Czech Republic)	+1	
Natural resources (basic)	**Water scarcity; highly permeable, sandy soils**	**-2**		**Fertile soils; potential for land exchange with producers of agricultural commodities**	**+2**	
Unskilled & semi-skilled workers	Do not play a major role in small-scale and specialized production	0		**Lack of availability and high degree of dependency on seasonal workforce**	**-1**	
Tangible, & intangible infrastructure (e.g., IT connection)	Benefits from the metropolitan region with excellent internet connection and technical infrastructure	+1		Does not play a central role, depending on the respective value chains and logistics requirements	0	
Long-term knowledge (specialized)	Highly specialized production knowledge; nevertheless, increase in the range of vegetable types and varieties in the last 20 years	+1		**Highly specialized production knowledge for a limited number of key products**	**+2**	
Specialized factors (sector-specific banking, research facilities)	Due to the long tradition and high level of investment, good access to outside capital; rapid adjustments in products and processes show intense ties to R&D	+1		No exceptional advantages or disadvantages identifiable compared with other vegetable production regions in Germany	0	
			2. Demand conditions			
Presence and nature of (domestic, regional) customers	**High identification of the region with vegetable production; high image of local markets as well as interregional retail**	**+2**	Satisfactory	A large part of the production is marketed interregional; regional sales of minor importance (with the exception of fresh vegetables)	-1	Neutral
Quality pressure (positive: innovation; negative: buyer dependencies)	**Increased bargaining power of customers (food retail) (--); high quality standards required (private and public) (+)**	**-1**		**High quality standards required (private and public); requirements for region of origin of raw material labels could increase competitiveness of products from this region**	**+1**	
Innovation pressure (customers open to new ideas)	Organic production, regional demand; producers are constantly adapting and developing their products to remain competitive and become more cost effective	+1		Most production goes to the food processing industry; only a limited product range, therefore reduced innovation pressure	0	
Accumulation of companies; specialized labor pool	High professional labor competence required; limited labor supply that can be employed on production level	-1		Low degree of relevance of specialized skills; limited cooperation between the actors during the peak season for the exchange of seasonal workers	0	
Agglomeration of companies; specialized infrastructure	Highly innovative actors; knowledge spillover effects	+1		No specific innovation or start-up scene; high market concentration on the production side	-1	

Table S1. Continued.

Determinants	Garlic Country	Det. ass.[1]	Overall ass.[2]	Open-field production Lower Bavaria	Det. ass.[1]	Overall ass.[2]
3. Related and supporting industries						
(Internationally) competitive suppliers and associated industries	Cluster primarily regionally anchored, but with a strong interregional orientation due to level of production that exceeds local demand; entry into international competition; close integration with nearby metropolitan region	+1	Satisfactory	**Strong position of local processing industry, (inter-)national distribution**	**+2**	Satisfactory
Economies of scale (cost, size effects)	High level of specialization, product diversification (-); increased technology use & mechanization to reduce costs and compensate for labor shortage (+)	0		Large areas under cultivation; joint and cooperative production and processing facilities	+1	
Economies of scope (coordination and networking)	Strong connection to extension, associations, cooperatives; city councils of Nuremberg, Fuerth, Erlangen push regional sales and marketing	+1		Producers complain about decline in cultivation advice & support from authorities; additional costs due to higher legal requirements (e.g., in plant protection); unclear situation of seasonal employment regulation	-1	
Joint innovation processes	Noticeable	+1		Limited	-1	
4. Firm structure, strategy, and rivalry						
Intensity of competition (increases motivation and innovativeness)	High density of companies in a limited area	+1	Very satisfactory	Established distribution channels and customer relations; rivalry tends to be among the local processing companies (labor, prices, inputs, export)	-1	Restricted
Type of competition (rivalry versus collaboration)	**Friendly and competitive cooperation; mutual respect**	**+2**		Presence of many companies with different scale and scope of production and processing (e.g., large companies with production and processing of vegetables; small cooperatives, contract farmers) limits collaboration among them – only loose links	-2	
Entrepreneurial drive for further development	New, younger generation of leaders within cluster; technology-affine junior managers	+1		Many large, long-established actors within the cluster (entrepreneurial approaches instead of small-scale agriculture)	+1	
Future intensification of competition to drive further development[3]	Strong	+1		Currently not foreseeable	0	

[1] Determinants assessment levels: 5-point scale from (+2) to (-2); bold fonts: extraordinary characteristics for the respective cluster region.
[2] Overall assessment levels: very satisfactory; satisfactory; neutral; restricted, very restricted.
[3] Based on aggregated assessments by the interviewees apart from production and trade levels (representatives of producer rings, cooperatives, associations; advisory service; consultants).