

**Table S1.** List of Categories and Sub-Categories including short descriptions.

<i>Main Category (Level I)</i>	<i>Sub-category (Level II)</i>	<i>Short description</i>
<i>Actors and organizations</i>	Public/nonpublic research organization	<i>Experts mentioned the main actors/actor groups and organizations that to their understanding are the most significant players in the horticultural innovation system and different aspects why, e.g., the ‘extension has a major role as translator between actors.’</i>
	Extension service	
	Growers	
	Retailers	
<i>Interaction and intermediaries</i>	Role of extension service (explicit)	<i>In interaction and intermediaries, the horticultural extension service was further specified as the most important intermediary for the sector with regard to relevance and influence. Experts described how extension service is organized in principle and which challenges (e.g., heterogeneity) and expectations (e.g., translator) are linked to this intermediary.</i>
	Interaction mechanisms in horticultural IPs	<i>In ‘interaction mechanisms’ different modes of interaction (e.g., change of roles and functions in IPs that are more complex, responsibilities taken by different actors) in horticultural IPs were subsumed.</i>
<i>Policy and institutions</i>	Sectoral funding schemes	<i>In policy and institutions main funding schemes (EEG, innovation policy programs) were mentioned and experts specified the necessity of coherent funding schemes for the success of IPs.</i>
	Coherence in funding	
<i>Knowledge base and human capital</i>	Labor	<i>In this category, two main aspects were mentioned: the labor situation for the sector in general and the state-of-the art knowledge in businesses with regard to consumption practices and monitoring on energy and heating as an economic factor within the enterprise.</i>
	Situational knowledge in horticultural businesses (e.g., on energy monitoring)	
<i>Technology and demand</i>	Lead technologies for eco-innovation	<i>In ‘technology and demand’ the key technologies (roof covering and material, climate computers, heating systems...) were listed. Another aspect mentioned was the ability for demand articulation of actors (spec. horticultural businesses), e.g., with regard to kind of technological solution they need to implement to increase energy efficiency.</i>
	Demand articulation	
<i>Competition</i>	National competition	<i>For ‘competition’ experts distinguished between national and international (mainly European) competition. Furthermore, other mentions in this category could be subsumes under sectoral innovation capacity and comparative advantages as major aspects influencing competition.</i>
	International competition	
	Comparative advantages	
	Innovation capacity	
<i>Innovation types</i>	Technical innovation	<i>Sub-categories emerging here as a result from the experts’ answers are technical, social and process innovation. The most mentions were with regard to technical innovations.</i>
	Process innovation	
	Social innovation	
<i>‘Typical’ horticultural IPs</i>	Phases in the IP	<i>The experts were asked for their understanding of a ‘typical’ IP. Mentions allowed to identify subcategories covering the role of different system actors along the phases of the IP. Interviewees related their answers to specific innovation examples or projects that they either had knowledge of; or were personally involved in. This IPs were in the fields of breeding, efficient light sources, energy efficiency in greenhouse construction or CO<sub>2</sub> labeling of horticultural products.</i>
	Initiators/sources of innovation	
	Role of science and development	
	Role of suppliers	
	Role of innovation policy	
	Role of extension services	

	<p>Role of retail and consumers</p> <p>Specific projects experts know about</p> <p>IPs adapted breeding strategies</p> <p>IPs increasing Energy efficiency (greenhouse construction)</p> <p>IPs CO<sub>2</sub> Labeling</p> <p>IP efficient light sources (LED)</p>	
Specifics of horticultural IPs	<p>Heterogenous sector structure</p>	<p><i>This generated knowledge about the perceived specifics within horticultural IPs as compared to other agricultural sub-sectors (e.g., animal production). Here, important aspects were sector specific regulation and funding, the quite specific structure of the horticultural system and sector specific practices of knowledge sharing routines that have established among actors.</i></p>
	<p>Sector specific regulation and funding</p> <p>Specific practices in knowledge and technology transfer (extension and networks)</p>	
Factors influencing horticultural IPs (hindering and supporting)	<p>Overall organization of IPs (hindering)</p> <p>Skilled labor situation (hindering)</p> <p>Missing support (hindering)</p> <p>Availability of networks sectoral/cross-sectoral (supporting and hindering)</p>	<p><i>Experts were asked to specify factors that influence the success of horticultural IPs and if so, how (rather hindering or rather supporting). One example for the subcategory 'missing support' mentioned was 'missing financial sustenance throughout the IP.'</i></p>
Innovation trends	<p>Positive trends</p> <p>Negative trends</p> <p>Necessary developments to realize energy efficiency innovation/eco-innovation</p>	<p><i>In the category 'innovation trends,' experts differentiated between positive and negative trends. One example for positive trends mentioned was an 'more informed discussion with regard to footprinting initiatives.' The 'development of labor market' was explicitly mentioned under negative trends.</i></p> <p><i>Lastly, one subcategory that resulted from the mentions is 'developments that would be needed to realize development and implementation of eco-efficient innovation.' Here different aspects from previous categories were taken up such as 'coherent funding,' 'willingness to change' among horticultural businesses or 'better energy monitoring in horticultural businesses.'</i></p>