

# Innovation in a changing society

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# Introduction

Mister Chairman, Ladies and Gentlemen,

I feel greatly honoured that I was asked to make a contribution to this conference of horticultural economists. The idea of exchanging views with you on this small but wonderful island felt like a great challenge to me. I was born on an island myself and I have come to understand that being on an island may have both its limitations and advantages. After all, on an island it is possible to shut out the wicked outside world and to be oblivious to its turbulence. Time then takes on a different dimension while memory and history can predominate in one's style of living. On the other hand it can also be said that islands have lots of space surrounding them so that, starting from the island, one could try to conquer the world or, at least, to have some effect on it. I wonder how it feels when a group of horticultural economists is meeting on a small island to reflect on their professional discipline. Will this group of professional colleagues show limitations that are similar to being an island in the world, or will they bring the dynamic quality of their world to the island? What is it that they seek in the seclusion of the island? Is it the value of their professional speciality or is it the value of interactions with the outside world?

This symposium was announced as being a scientific meeting of researchers. With the approval of the organisation committee I have taken the liberty to give the subject a broader definition. Thus, the issue will not be, for example, "technical innovation in a production system". The limits of the system are not drawn at the boundaries of individual businesses, but rather of horticulture in a broader sense, as an economic cluster. As the title of my talk suggests, I will discuss the domain of "innovation".

Obviously, we could discuss this from a scientific perspective. However, I will approach innovation specifically as a domain of entrepreneurs and I hope to demonstrate that different skills are required in this domain as compared to doing research, even in the field of economics.

I will try to show you that the seclusion of the horticultural community is being pried open by the turbulence of international society. The question I ask is: how is horticulture affected by changing conditions?

*Oikos nomos*, the Greek origin of our "economics", literally means "the theory of house rules". As a result, sociology, psychology and the discipline of economics were initially placed in one and the same category: the behavioural sciences. I believe that global

changes are such that the rules of the house are changing as well and that institutions can no longer be certain of their survival. Food for economists, indeed.

Before setting off I would like to introduce my colleague and myself. I am not an economist, although I was originally an expert in horticulture. I was active in applied horticultural research, studying crops such as fruits, vegetables and ornamentals. During the last five years I have been working at the National Council for Agricultural Research where I participated in several *foresight* studies (4: Agriculture 2015: ambitions for the 21<sup>st</sup> century). Right now I am also a staff member of the Foundation for Innovation in the Greenhouse Industry (6), which is administrated by entrepreneurs in horticulture. I felt really honoured when your chairman addressed me as “a leading industry figure”. This presentation was developed in close reciprocity with my colleague, Hans Rutten. Hans is an agricultural economist who used to work several years for the Agricultural Economics Research Institute (LEI) and, later, the NRLO. He contributed to several *foresight* studies in the sector of agriculture. More specifically, during the last few years he has been dealing with the organisation of innovation processes.

Naturally, I myself as a *horticulture expert* and Hans as an *economist*, we have asked ourselves the question, what is or what should be a *horticultural economist* in the year 2000? After all, we should be the team par excellence to have some ideas here. Being in your company, however, I will be cautious. Let us say that there are many different types of agricultural economists: they may be product-oriented, business-oriented or focussed on the structure of the industry and the market (e.g., a “strawberry economist”, an economist for the greenhouse industry or a market economist). Most of them sector-driven or supply-driven - all of them studying economic values that will determine the survival of horticulture: cost price, competitive strength, income. Still, the question is whether the sector’s survival depends on sector economics (cultivation and business systems and traditional market developments) or on understanding and responding to environmental factors.

*Briefly put, what is the central issue: the physical product, the production system and the lowest possible cost price, or the value that can be created? And if it is the latter, what are its implications for both horticultural entrepreneurs and horticultural economists? This is where I would like to develop some ideas in more detail.*

## **Message**

Horticultural economics has a future only if it is able to support entrepreneurs to answer questions such as:

- if the global environment changes so quickly, how can I respond?

- if the customer takes central position, which values can I create to attract him?

I have divided my paper into 5 sections:

- Horticulture in the 21<sup>st</sup> century: discontinuities will change enterprising.
- What is value in "the new economy"?
- What is innovation?
- A reflection on horticulture and economics. What is it that should be practised by horticultural economists in the 21<sup>st</sup> century: an economics of horticulture or an economics of enterprising?
- I will end with a proposal for a new agenda for economists familiar with horticulture.

# 1. Horticulture in the 21<sup>st</sup> century: discontinuities will change enterprising

## Future challenges

Towards the end of the 20<sup>th</sup> century, in the years 1995-1999, the NRLO conducted a foresight study called "Agrosector 2015, ambitions for the 21<sup>st</sup> century" (4). The foresight study made it clear how the social conditions of agriculture and horticulture were changing and what the importance was of responding to those changes if the sector wished to remain strong and respected in the future. Apparently, it is the outside world which determines how the sector can and should develop.

The foresight study was carried out by the NRLO in association with interested parties from trade and industry, government agencies and knowledge institutes. Foresight studies should be distinguished from forecasts. The future is uncertain and far from unambiguous, while developments may point in completely different directions. This has been the reason why most forecasts fail to come true. In the case of foresight studies the issue is not *if* something is going to happen, but rather the question, "If something happens, what should we do?" It is a mental experiment in order to learn how to act under various conditions. Foresight studies will clarify where current conditions are creating tensions, but they will also point out dilemmas and opportunities as well as areas where there is a need to take initiatives. Foresight is not about reducing uncertainties (as is so often the case in research studies), but about acknowledging uncertainties and learning how to deal with them (4, 19).

The NRLO also conducted a foresight study about developments in science and technology (20). This foresight study produced an overview of major technological breakthroughs (e.g., in areas such as ICT and biotechnology and nanotechnology), but it also made us more sharply aware that all those breakthroughs took place in scientific disciplines that were not part of the traditional agricultural sciences. Here too, obviously, it is advisable to take a look outside. Here, too, it has become clear that the possibilities provided by those breakthroughs are also determined by the social framework. Following the NRLO (4,14), the Foundation for Innovation of the Greenhouse Industry raised the question as to how greenhouse horticulture might develop in the Netherlands (5). Several major spearheads were selected.

The NRLO foresight studies have resulted in a number of challenges for agribusiness, including greenhouse horticulture. I will mention them briefly:

- **From narrow to broadening value policies**

For many decades, agriculture and horticulture have been focussed almost exclusively on economic values: income, cost price and competitiveness and the demand for sufficient amounts of food of good quality levels. Other values - such as ecological, cultural, ethical or spatial values - were seen as limiting conditions to operational management, frequently inconvenient and not really a source of guidance for entrepreneurs. However, social developments such as mentioned above can no longer be ignored. The essential change to be made by agribusiness is that it accepts its responsibility for maintaining and developing social values. In doing so it is no longer acceptable to start from a value hierarchy (economics being more important than other values); instead, the starting-point should be equality. A broad value policy of that kind will make it necessary for entrepreneurs to take a different approach in social issues. Society has become an active party, taking expertly part in discussions and demanding to be heard in decision-making processes. Now that horticulture has grown into a technologically advanced sector as a result of scientific efforts, it will have to integrate social values into operational management in order to command a position of respect in society.

Examples of this actually are all over the place. Just think of the social debate on the applications of biotechnology in food production or the enormous increase in the demand for biological food products. They are not local phenomena, to be found only in the Netherlands or in Western Europe. On the contrary, they are global phenomena. As a result of breakthroughs achieved in molecular biology, both national governments and multinational companies whose key activities involved food and pharmaceuticals defined this area as their scientific spearhead for the first few decades of the 21<sup>st</sup> century. Global insecurity about the safety of modified food products has shed an entirely different light on this development. It is no longer possible to push new technologies onto the market by force. Society surely knows its mind.

One may think also here of the effects of world-trade globalisation on countries and regions, on environmental sustainability or social justice. The dramatic developments at the meeting of the World Trade Organisation in Seattle were symptomatic of this reversal. Who hasn't heard of the revealing actions during the meeting by the French leader, Bové, who put his finger on the threat to regional product diversity and social infrastructure in many, many countries? It was front page news in all the world's leading

newspapers. The French paper *Le Monde* wrote that Bové was the most important citizen of 1999 (9). Gibbons (11) gave a striking description in his article in *Nature*: traditionally, science prescribed what changes should be made while both industry and society sat back and waited passively for what might come. This has now become a passivity of the past: society “speaks back”, asking questions and expecting to be given relevant answers. Entrepreneurs will have opportunities if they manage to command respect and trust.

Discontinuity is also apparent from the fact that the ministries of agriculture in several countries have been changing their names. In Denmark it is no longer called the ministry of agriculture; instead, it is the Ministry of *Food* and Agriculture. The same applies to England. In the Netherlands the Ministry of Agriculture, Nature Management and Fisheries recently published a policy outlook paper under the expressive title of “*Food and green*” (8).

Food for citizens has become the dominant perspective rather than supporting farmers and market gardeners to produce food.

- **From agrichains towards networks**

Until recently, horticulture presented pure producer organisations, who placed their anonymous mass products on an anonymous mass market through independent organisations. The reversal towards vertical agrichains or hortichains is still in progress, although it is no more than an initial step that should make it possible to respond swiftly and flexibly to market developments. The present symposium is a good sign that changes are taken seriously. And yet it is just a first step. Indeed, agricultural and horticultural chains are practically the only terms used as yet, although some also mention vegetable or ornamental plant chains, while others even talk about the tomato chain, the paprika chain or the rose chain. The question still is, Who are at the steering wheel of agrichains: producers, wholesale dealers, retail or consumers? When has the reversal from supply-driven to demand-driven really been made (17)?

The consumer market has shown high rates of fragmentation. The Netherlands is sometimes said to have 15 million markets, each one having distinct characteristics. Consumers are capricious and their purchasing behaviour is dependent on the spur of the moment, which makes them unpredictable. As “the purchasing agents of consumers” supermarkets flexibly respond to this tendency by providing a highly differentiated range of products. This is what will eventually lead to consumer-driven or demand-driven chains. The ultimate result will be that consumers become individuals who have their individual package of desires for custom-made products. Anonymity is broken from two sides.

No one really knows how things will develop. However, ICT will help to turn rigid horticultural chains into much more flexible and sometimes temporary networks that can respond swiftly to market developments. Horticultural chains will turn into networks associated with other sectors. Network like structures exist even now, for example in distribution, logistics, delivery and consumer relations (direct delivery from market gardener to customer). Some say that a new economy is emerging which is based on networks of direct contacts between producers and customers. As a result, competition is no longer between businesses producing physical products, but rather between networks that are dominated by immaterial values, such as a basis for trust or the story of the product.

Just consider the role played by e-commerce, for example how a new and international company such as Floraplex, which is quoted on the stock exchange, provides an entirely new commercial platform in addition to those in place (2). The result is that it becomes much more difficult to anticipate competition as it may come from any direction. Existing structures can be overtaken, which makes them vulnerable.

- **Towards developing an international perspective**

Traditionally, horticulture has seen strong developments around large urban conglomerates. In Europe only, several centres have shown high growth rates over the last few decades while powerful international trade has been developing. For example, consider Dutch horticulture. Its export shares of both flowers and vegetables are above 70%. There has been great pride in their large share of exports and their capacity to keep finding new markets abroad to sell Dutch products. But this will not suffice in the future. It won't be sufficient to simply approach new markets to sell one's products; rather, it will be necessary to actually install oneself in local markets and to get to know its consumers, which is to say, to penetrate the differences between those markets on the inside. The point no longer is to sell standardised products around the world, but rather to make the most of differences between local markets (13).

The formation of the EU, the global liberalisation of trade and the revolution in information and communication technology have made it necessary to change from national to international perspectives (13). Following the global concentration of retail, global groups and networks will develop at great speed as well, allocating products "all over the world" and supplying them to supermarket groups.

If supermarket groups manifest themselves as "purchasing agents acting for the benefit of consumers", the consequences for supplying trading organisations and producers are tremendous. Will existing chain organisations be able to respond? And what will be the significance of global concerns such as Fyffes, Dole, Chiquita? Fyffes has been

presenting itself in Europe as a marketing organisation for large producer organisations outside Europe. Dole has been strongly expanding its production interests in ornamental crops. As a result, internationalisation is getting a different quality (2).

The 1999 conference of the World Trade Organisation in Seattle also highlighted a new phenomenon, i.e. the international combination of social organisations aimed at ecological sustainability and social justice (9). This new development also requires a fresh international perspective, even in horticulture.

- **Towards greater multiformity**

The development of agriculture and horticulture in the western world has been dominated particularly by economic preconditions. Gradually, different types of businesses or management styles have emerged. The EU has transformed traditional agricultural policy into a policy for rural areas, paying much more attention to multipurpose types of land use in rural areas. It touches particularly on agriculture and outdoor horticulture. In outdoor horticulture the phenomenon of part-time entrepreneurs has emerged, where townspeople are also part-time market gardeners.

But even in the greenhouse industry, especially in the Netherlands, different types of businesses have been developing, including high-tech substratum-based cultivation, ground-based cultivation and biological greenhouse horticulture.

In the Netherlands it is hardly accepted that large greenhouse locations are realized in rural areas that serve many purposes. Open farming country along the outskirts of towns is not only suitable for certain types of agriculture, the same areas are also performing an increasing number of functions for people from the cities. These areas in the conurbation of Western Holland then serve to support natural and recreational developments. As soon as new areas are developed, those developments are supported by combining all kinds of functions: greenhouse horticulture with clearly defined green belts and ponds that may also be used for recreational purposes. The multipurpose use of space does not make things simple for the greenhouse industry. A tendency is developing to seek increased alliance with industrial areas, where industry provides residual heat and CO<sub>2</sub>.

## 2. What is value in “the new economy”?

I come back now to value policy. An active and broad value policy may include socially sound types of doing business. Not only value maintenance is involved here, but also value creation. In the NRLO view, the point no longer is to simply respond to social preconditions, but to show active and innovative industrial behaviour. And to be aware that value creation is less and less about physical and material goods and more and more about immaterial values: information, trustworthiness, beauty, illusion, emotion, plants with a story. What counts is the contribution made to the health and well-being of the citizens (15).

Some economists speak of “a new economy”. Luc Soete, a Belgian professor at Maastricht University, who is sometimes called Europe’s leading New Economist, recently gave an expressive summary (16): *Technology, so to speak, is constantly undermining the concept of - economic - value. Knowledge stored in products is more and more set down and then it is a very simple thing to disseminate that knowledge: subsequently, products can be made all over the world in standardised ways... resulting in a drastic reduction of - economic - value. As knowledge is more and more registered, it ceases to be where the value is: companies anticipate this development by providing free hardware while offering services and becoming service providers.*

*This not only applies to electronics and computers, but also to tomatoes and roses and, last but not least, services. Value assessment is beginning to become completely independent of information. If a brand name can guarantee the quality of a specific product while monitoring the entire production chain, it will be successful in the 21<sup>st</sup> century. Liability will be essential. Whatever value remains is the immaterial use of products. One no longer pays for a tomato or a rose, but rather for the aura of a brand name because it is trusted. The key question for the future in the new economy is how we can keep extracting value from those immaterial roots of products or services (apart from protecting any rights of intellectual ownership).*

Rolf Jensen, managing director of the Danish office of foresight studies, reached the same conclusion in his book *The Dream Society* (12). Wijffels, former Rabo Bank president in the Netherlands and one of our more influential thinkers, plainly states that the material aspect of our lives will grow less dominant and he points out that the share of physical products in our GNP is decreasing while the proportion of immaterial matters is increasing (1). We are growing towards a knowledge economy in which physical production is replaced by the production of knowledge and services. There will be a shift of emphasis from products to establishing relations with consumers. Knowledge

designed to respond swiftly to new individual preferences will be replaced by information about those very consumers. Chips made by multinational Philips will soon be found in all articles of clothing, transmitting data about the qualities of their usage and users.

Supermarket chains are daily confronted with the question of confidence. Albert Heijn, the leading Dutch supermarket chain, receives many letters from customers on the subject. As a result, the brand name of "Albert Heijn" acquires a much deeper meaning because, in the eyes of the customers, it represents the ultimate reliability of products. Thus it will be in this perspective that the supermarket chain will approach supplying companies because the attitude adopted by Albert Heijn is that it is "the purchasing agent of its clients". And their confidence should never be betrayed.

Thus, the powerful issues of the future will be health, well-being, emotion and reliability. The story of a product or the reliability emanating from a brand name requires quite different ways of reasoning than the production of physical products such as tomatoes or roses. In this perspective, the quality management systems created by independent producers or chains all represent a step in the right direction, although they are insufficient to respond to this approach of immaterial values as it was described by Soete and as it is practised even now by supermarket organisations.

### 3. What is innovation?

The literature has provided many, many definitions of what is considered to be “innovation”. Innovating really and simply means “renewal” (18). Still, not every instance of renewal can be considered an innovation. Innovation refers to inventing and exploiting a change or renovation while generating new demand and at the same time using it to create value (7). In many cases, innovating is associated with technological modernization, with producing better products or improving operational processes. It may also assume more complex forms, including different types of marketing, distribution, service and organisations (18). Its essence is to bring about change or renovation, involving a fresh combination of mainly pre-existing knowledge that can be brought to produce value. It frequently involves putting things in a different perspective, thus revealing and using new opportunities. As a result, the domain of innovation should be distinguished from curiosity-driven scientific research, which is designed to produce new knowledge and insights (“inventions”) without any intention of seeking commercial applications. Indeed, the two, i.e. invention and innovation, often do not agree. For example, Edison was a great “inventor” although he failed as “innovator”. However, both businessmen and scientists are motivated towards innovation by curiosity and amazement. Businessmen will ask themselves whether things can be done better or differently and then they will do everything they can to exploit the innovation. Scientists just want to know how phenomena can be explained or what makes the world go round.

To illustrate that not every instance of renewal is innovation *The Economist* (7) described the example of a couple who began a sandwich bar alongside or right across from other, similar sandwich bars. This is considered to be no more than a new business activity (venture), it certainly is not an innovation. However, the approach taken by McDonalds when introducing hamburgers was. It did not simply create another hamburger, but rather something quite new. In fact, it created a new concept of a high-quality and standardised product, hygienically prepared and delivered at very short notice at a minimum price. It introduced a new method of preparing the product while their employees were trained in efficient and pleasant ways of serving their clients, making them believe that they never had anything like that before. As a result, it also created an entirely new market.

#### **From technological innovations towards complex system innovations**

The NRLO recently published a report called “Innovation with ambition” (18). It not only provided an expressive description of the elements referred to above, it also divided types of innovation into five categories which differed in complexity.

The more simple innovations refer to products or processes. They often involve just one single employer. In case of innovations of transactions, markets or environmental conditions, however, the number of parties involved tends to increase strongly, thus also increasing their complexity. It is getting more and more difficult to realize this type of innovation as the relevant parties frequently have divergent interests and responsibilities. Also, these innovations tend to involve organisations rather than just individuals. These types of innovations we call "system innovations". The essential thing is that several parties, mostly from within the sector or chain involved, although more and more often coming from outside the sector, must make their contributions if those system innovations are to be realized. They are no longer focussed on the amount of innovation going on at individual business level; instead, their approach requires that the entire industry or, at least, a group of businesses is involved. They frequently involve radical renewals, whose solution requires new methods. Mostly breakthroughs can be achieved only if legislation and regulations move along, and institutions move along as well. In more extreme cases, existing rules and institutions will disappear to be replaced by new ones. System innovations are much less frequent, although they are more fundamental, more drastic and more complex. Big innovative changes are sometimes commanded by market conditions: consider for example the reversal from supply-driven to demand-driven chains. In other cases it is government who guides developments, see for example the theme of sustainable development. System changes of this kind take up a lot of time. They often involve reversals covering periods of 10-15 years. Are you aware of the amount of time that has passed since the concept of chains first appeared on the agenda? And how long will it take to realize a sustainable greenhouse industry?

### **Reversals and changes in perspective**

I would like to give a few illustrations of reversals of reasoning and changes in perspective that will have strong effects on horticulture as a system.

- *Food for citizens rather than production by farmers*

Governments of numerous countries have made this change and have altered their policies accordingly. The Codex Alimentarius is becoming of crucial importance. Food should be faultless, traceable and reliable and its production should meet social preconditions. Producers are allowed to deliver if they meet those conditions. In Denmark the Minister of Food and Agriculture has established a think-tank which has weekly brainstorming sessions with representatives of various social factions: environmentalists, ecologists, top-ranking chefs, consumers etc. Regulation is adjusted to the wishes and needs of consumers. Innovation policies are aimed at just that, they are certainly no longer aimed at production methods as such. Which will lead to consumer-steered production: you are what you eat.

- *Sustainable agriculture and horticulture*

Worldwide this is put on the agenda by governments. Environment (fertilizer wastes, plant protection) and energy was the first topics, but later on the policy was tightened up by climate policy. People in the Netherlands sometimes refer to a sustainable greenhouse industry which has “neutral climatic effects” while realizing a drastic reduction of CO<sub>2</sub> emissions. We talk about a system transition of fossil energy to low carbon energy sources. Would that be possible in the Netherlands? And what should be done to achieve this?

- *Biologicals products rather than “common” products*

The demand for biological food products is strongly increasing and this is perpetuated by encouraging government policies.

- *Emotion, trust and information rather than the physical product*

If these elements become the core business of a company, even in horticulture, what will be the implications for employers and their commercial activities?

### **Organising system changes**

These reversals not only require different types of reasoning in order to find solutions, they also require changed ambitions and behaviours, changes in the rules of the game as well as institutional modernizations. A policy aimed at achieving system innovations cannot be the responsibility of a single party, either government or industry. It will lead to new types of public-private arrangements based on a long-term vision (18). What is needed is that relevant parties take this vision as a starting-point for setting off together on a process of exploring innovation. It is what we tend to call a designing process approach since no one can really estimate the outcomes of the innovation process. It also means that new knowledge is gradually developed in a joint effort, which Gibbons (10) called discipline-transcending knowledge. It will make high demands on the administrative qualities of those involved. It will also require their long-term commitment.

### **New and temporary institutions**

The Netherlands has had experience with public-private partnerships in the field of system innovations. The government took the initiative here to develop new areas by establishing new institutions for a period of four years. Government financial support during the initial phase is 100%, after that trade and industry are expected to take care of a considerable share of the costs. The government decided to have temporary

institutions because existing institutions and knowledge institutes proved to be difficult to transform with a view to their new tasks.

Examples include the Centre for Agro-Chain Competence (ACC). After 4 years the initiative was expanded to include several more sectors as well as logistics and ICT issues, which resulted in CLICT (Chain networks, Logistics and ICT) (3). In a completely different area, an institution was created that would deal with issues regarding multipurpose use of space: Habiforum. The underlying idea is that space in the Netherlands is so scarce that specific areas may serve several functions. One may think here of building underground or stacking, or of combining agriculture and horticulture with nature and recreation. Based on their quality and expertise, knowledge institutes may be invited to participate in specific consortiums which are created to carry out new programmes.

### **New legislation and regulations**

In Denmark the new “food” policy paradigm has been the basis for constituting a new innovation law. What it implies is that, for some part, inhibiting rules have been removed while activities designed to improve food quality and safety are promoted. Production subsidies in agriculture and horticulture have been abolished.

As early as 1982, the United States made a crucial change in legislation in order to make provisions for intellectual ownership. As a result, researchers may be more likely to have a share of the revenues of their findings (as opposed to companies or universities alone). It is seen as a major boost to the innovation boom in the United States (7).

Other examples here may include fiscal measures, such as the “green” or environment-conscious schemes existing in various countries.

### **Market control**

Previous examples of market-controlled or even consumer-controlled production are self-evident. For instance, Rijk Zwaan, a Dutch breeding company, has taken this development quite far by making an inventory of consumer wishes in consultation with its customers while adjusting the entire breeding programme accordingly (2). It also takes care of the logistics of all products throughout the chain. Customer involvement appeared to be essential to building trustful and strong relationships.

### **What should horticulture do?**

In the agrarian community of the Netherlands, horticulture is taking the lead in terms of both destruction and renewal. It is a real example of Schumpeters’ creative destruction: drastic changes in crops, operational systems, market-driven innovations. Also, one has a keen eye for responding to major discontinuities, reversals that require the horticultural system of the Netherlands to make innovations. The formation of the Foundation for

Innovation in the Greenhouse Industry is a telling example (6). The interesting thing here is that although the Dutch greenhouse industry is swamped by a strong wave of individualisation, there is still a tendency to co-operate in dealing with issues that transcend the boundaries of individual businesses (such as system innovations resulting from major discontinuities of thinking) in order to gain new insights, to find inspiration and to build new expertise.

Dutch horticulture want to be ready for the future.

## 4. A reflection on horticulture and economy

A crucial question to you is: What may be the role of horticultural economists in the greenhouse industry of the 21<sup>st</sup> century? In what ways can they be of service to entrepreneurs (and other target groups)? In what ways can they be distinguished from business administrators, consultants and others who give advice or provide knowledge? Let me turn it round: What are the questions asked by a grower and what are the other questions asked by entrepreneur in the greenhouse industry? Growers will ask mostly questions about the economy of cultivation and operational processes, the cost price of their product and the markets where they can best offer their products. Entrepreneurs in the greenhouse industry will raise questions about logistics, chains, distribution, e-commerce, markets, brands, value creation and *customer values*, but first and foremost about how a relation of trust can be developed with their customers and what kinds of information and services will be relevant to them. When looking round, their eyes will not stop at sector boundaries: most of what they learn comes from outside horticulture and they know how to interpret developments in terms of their own business. Some of them will develop into "*service providers*". The entrepreneur will begin to control his own innovation processes (15). He can only survive if he innovates faster than his competitors.

There is no doubt that the future, too, will have growers. But entrepreneurs in horticulture will be dominating. Horticultural economists will therefore see a considerable shift in their market. Increasingly, they will be general experts who make connections between various disciplines while providing employers with services to develop the business of horticulture. Not only economics is involved here, but also an understanding of the international and social environment. It will be more and more important that their professional discipline also includes insights derived from psychology, sociology and public administration. And this will lead to a completely different definition of a horticultural economist.

## 5. A new agenda for economists (familiar with horticulture)

For such a new agenda subjects or themes may be deduced from major shifts, changes of perspectives and thinking mentioned earlier in this lecture. I summarize a few of them now:

- consumer driven product development and chain management
- information and immaterial assets as sources for value creation
- producer dilemma's caused by global sourcing and marketing of global concerns
- biological production, chain management and marketing
- sustainable horticulture (climate neutral greenhouses)
- implications of new transaction mechanisms by ICT and e-commerce

## 6. Final remark

Mister Chairman, Ladies and Gentlemen,

I hope to have given you sufficient matter for discussion, food for horticultural economists.

Perhaps my story was less about horticulture than about its environment. Which has been my intention anyway: make sure that you are not a horticultural economist on an island, but discover what the new questions and uncertainties are that are important in the outside world.

And look around: shall we get lost? Follow me, I know the way!

Thank you very much.

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