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Transition towards sustainability: Dutch greenhouse parks as a touchstone for Flemish clustering experiments

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Abstract— Greenhouse horticulture can play a major role in Flemish rural development, regional economy and employment. However, the sector deals with structural problems. Scale increase of greenhouse firms is required for economic reasons, but high investments and risks make this quasi unsupportable for individual farmers. Clustering greenhouses into greenhouse parks is a possible way out. Through collaboration and mutual material exchanges, firms enjoy scale effects and eco-efficiency is enhanced without individual enlargement.

The government is planning pilot projects to investigate possibilities of greenhouse parks in Flanders. Obviously, many obstacles are faced, such as spatial planning, coordination of policy levels and institutions and interactions with different stakeholders, e.g. local people, environmentalists, the distribution sector. Moreover, the mere set-up of such a high impact process is a challenge.

We look at similar projects, implemented in the Netherlands in order to obtain a better view on possibilities, critical success factors, triggers and threats for greenhouse parks in Flanders. Dutch cases of successes and failures are explored by case study research. After the first data gathering round, only preliminary results are presented. Different concepts such as transition and system innovation are used as theoretical lenses in the analysis. In a later phase of the research, information and lessons learned from Dutch projects will be combined with research data of Flanders.

First results indicate the importance of “Related activities in the neighbourhood”, “Land”, “Financial conditions”, “Role of different policy levels”, “Support of stakeholders”, “Collaboration” and “Process specific parameters”.

Keywords— Greenhouse parks, transition

I. INTRODUCTION

A. Theoretical background

Rural development - The modernization paradigm that once dominated agricultural policy, practice and theory is being replaced by a new rural development paradigm [1]. EU policy shifted away from agricultural modernization to rural development [2] and a new, integrated approach to rural development is seen in an increasing number of initiatives in several countries [3]. This shift in paradigm does not necessary exclude that compounds of this integral

development get more modernized. Industrial ecologists even look to technological innovation as a central mean of solving environmental problems [4].

Transitions and system innovations- Transitions are transformation processes in which society changes in a fundamental way over a generation or more [5]. Essential is a paradigm shift: “we can reconfigure our world if we can reconfigure our mindset” [6]. In this regard, the above mentioned paradigm shift could be inspiring for more drastic changes in a sector that, with decreasing success, followed a traditional modernization process. By using the concept of transition in our contextual and data analysis, we examine current and future tensions between welfare, wellbeing and the environment [7], with sensitivity to existing dynamics and regular adjustment of goals to overcome the conflict between long-term ambition and short-term concerns [5]. Transitions require system innovations. System innovations are organization-transcending innovations that drastically alter the relationship between the companies, organizations and individuals involved in the system. A system is defined here as a coherent set of components, which influence each other in a particular direction, for instance an economic sector, a trade sector, a societal domain, or a town or region [8]. Following this definition, clustering of greenhouses into greenhouse parks in Flanders can be understood as a system innovation.

Clusters- Porter [9] defines clusters as geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include for example suppliers of specialized inputs and extend often downstream to channels and customers and laterally to manufacturers of complementary products and other related industry. Finally many clusters include governmental and other institutions such as knowledge institutions. Compared with market transactions among dispersed and random buyers and sellers, the proximity of companies and institutions in one location – and the repeated exchanges among them – fosters better coordination and trust.

B. Contextual Background

Sector - Greenhouse horticulture is a high performant and still modernizing sector. However, in a non integrated manner it may not remain sustainable. The sector can play an important role in rural development, regional economy and employment [10]. For Flanders, using less than 0.3% of total agricultural area, it counts for about 15% of total primary production value. Because of this efficient land use, it may be of particular interest in regions with high urbanization pressure, and high land prices, such as Flanders.

However, the sector is dealing with structural problems. Pressure has increased because of land scarcity, increasing environmental exigencies, food policy regulations [10] and increasing energy prices. Indeed, the regulations concerning landscape, nature, environment and product quality, make farmers suffering from a cost prize squeeze: production costs increase while revenues are at best stagnating [2]. For profitability reasons, most greenhouse farms should enlarge. Nowadays, most farms in Flanders are smaller than the minimal optimal scale [11]. High investment rates and a high risk/return rate, make investments and risks of enlargement quasi unsupportable for many farmers. The last decade, the replacement rhythm of greenhouses is even too low to maintain the greenhouse area [10]. Strategy to respond to these pressures is influenced by a variety of considerations, e.g. the issue of succession [12]; [13]. Many greenhouse owners passed the age of 50, having no or uncertain succession.

Pilot projects – Drastic changes are necessary to solve these problems. Clustering greenhouses into greenhouse parks is a possible way out. But such an innovative concept does not fit into the present technological, institutional and cultural context. It requires an – often fundamental-adjustment of infrastructure, rules and behavior. Only when the existing regime can be locally and/or temporarily changed, it becomes possible to engage in learning processes. These are necessary to improve new concepts and demonstrate them to a wider circle of people [14]. Therefore, the Flemish government is planning some pilot projects to cluster greenhouse firms together in greenhouse parks, which can be defined as areas of greenhouse concentration [15]. Using collaboration as a competitive strategy, firms can enjoy scale effects without individual enlargement and they will be more eco-efficient [16] at greenhouse park level, for example: communal water stockage, waste processing, CO₂ delivering and heat production. Besides this, there are spatial advantages and social added values [10]. Clustering greenhouses with soil bounded agriculture or industrial activities could even enhance eco-efficiency effects.

C. Aim of the study

The aim of our study is to look to a better organizational integration in agriculture, because awareness grows that this is as important in dealing with rural needs as the development of integrated policy initiatives and actions themselves [17]. We will base our research on greenhouse park development initiatives in Flanders. In particular, we intend to obtain a better view on the potential of realizing greenhouse parks in Flanders and the way to do it. The initiatives still have to cope with difficulties: such as spatial planning, coordination of different policy levels and institutions and interactions with stakeholders, e.g. inhabitants of the neighbouring areas [18]. We will not analyze only the Flemish situation, but we will look also to the Netherlands, where greenhouse parks already exist [15]. These parks brought many advantages, however new challenges and difficulties are asking now for a transition approach [19]. Therefore we intend to derive critical success factors, triggers and threats to greenhouse parks in the Dutch context. Further, we will depict the criticisms on succeeded projects, lessons learned and find out what happened in areas where the projects failed. Taking into account the context differences, we will compare and integrate this information with results of interviews and case studies in the region of Flanders.

II. METHOD

Successes and failures of clustering in the Netherlands will be explored through case studies [20]; [21], interviews, observations and written sources. A grounded theory approach will be used [22] based on [23]; [24] in which the researcher attempts to derive a general, abstract theory grounded in the views of participants in a study. This process involves using multiple stages of data collection with intervals of thorough analysis. There is a constant comparison between data and emerging categories.

A. Getting into the field

Besides reading, participation in the annual public event of greenhouses in different areas was a first step to get conversant with the field. Field notes report of visits to greenhouses and conversations with different stakeholders (glasshouse gardeners, employees and municipality) about innovation, firm management, collaboration and the clustering process.

B. Sampling and data collection

Case studies are chosen following a flexible theoretical sampling strategy [25]. At the start of the study, we aimed to include successes and failures. Later, data indicated to make also a difference between greenhouse parks that have been planned by the Dutch authorities and those that have emerged on initiative of other stakeholders.

A key approach for sampling informants, is using numerous and highly knowledgeable informants who view the local phenomena from diverse perspectives, including outside observer [21]. Therefore, respondents are member of official organizations or are linked to a specific greenhouse park case. Informants were chosen by the researcher, independently or by chain sampling [25] through network contacts and interviewed informants.

9 semi-structured interviews between half an hour and 3 hours were done. More informants will be interviewed in a next data-gathering round.

C. Coding and data analysis

N-Vivo 8, a software package for qualitative data analysis, is used for storage and classification of data and to ease data analysis. Transcripts of interview tapes were made. For data analysis, the systematic steps of grounded theory are followed. These involve generating factors or categories of information (open coding), selecting one of the factors and positioning it within a theoretical model (axial coding) and then explicating a story from the interconnection of the factors (selective coding) [26].

Open coding- The aim of open coding is to make sure that all the data sections that are related under the same heading can be retrieved with ease. An associated aim is to make sure that the volume of these headings is manageable and meaningful. So, open coding can be understood as cutting and pasting sections of text onto cards that then could be analyzed together as one factor.

Axial coding - For axial coding, the “one sheet of paper” (OSOP) methodology [27] was used. A completed OSOP is a summary of all issues that are raised by the extracts of one factor together with the ID of the respondent, which raised the issue. It is important to retain nuances in the accounts and not to collapse data into broad headings. Then the real axial coding starts, as the next step is to consider how all these issues might group together in broader themes to explain ‘what is going on in the data’. This explanation takes account of all the issues raised by the extracts, not just of those that are most common.

Selective coding - is the explication of a story from the interconnection of different factors.

Analytical depth - During axial coding and selective coding, going back to the literature can enrich analysis. Where do findings fit in? How can they further informed by theoretical literature?

D. Research in progress

Until now there has been one phase of data gathering. A second phase of semi-structured interviews follows. Findings will be validated and refined while new insights will arise until saturation.

III. RESULTS

As data collection and analysis are not finished yet, only preliminary results are available. Our first findings indicate that important factors that influence the clustering process are “Related activities in the neighbourhood”, “Land”, “Financial conditions”, “Role of different policy levels”, “Support of stakeholders”, “Collaboration” and “Process specific parameters”.

A. Related activities in the neighbourhood

A critical mass of other greenhouses in the neighbourhood is a motivation to join a greenhouse park, as well as the presence of suppliers, clients and related industries. “*Gardeners don’t want to go sitting alone in a polder*”. The respondents state, in accordance to Porter’s clustering theory [9], that, if a critical mass of greenhouses is present, service level will be higher.

That critical mass will also cause repeated exchanges between companies and institutions, which will foster better coordination and trust [9]. “*so in general they don’t make difficulties about licenses (...) in the other municipalities they have much less experience [with horticulture] (...) they go for 100% certainty (...) and they delegate it as much as possible to others (...) but if you have done that several times (...) you will get more self confidence and it can go faster*”

B. Land

Important factors are availability of the land, spatial claims from other sectors, speculation and price of land. “*They bought it in one day so speculants could not come in between later, and they called to province: oke, fine! the glass can come here! (...) [Speculants] didn’t know it yet, and for that reason he bought all the land in one day, so the neighbours couldn’t make deals with each other (...)*”

Following our first findings, the less actors to deal with and the more money available to buy out or to compensate

the owners to move, the more easy will be the process. *“Actually we have never bought land from a farmer, or almost never, and most of the time we just offered them to relocate to double acreage.”*

C. Financial conditions

As money can be an easing factor for land acquisition, there are also other process costs. Examples external actors to do study work, support for the local community by funding for example their football team. *“and if the people become better of it, mostly, they never make a lot of troubles.”*

In the realization phase high initial public or private investments has to be done, like building extra roads, communal water and energy systems etc... For the gardeners, special, complex financial agreements with the bank can be helpful, for example a sell and lease agreement for the greenhouse with the possibility to buy it back later. *“some creativity is required, and then you need must be careful to have the right advisors”*

D. Role of different policy levels

Local and provincial, politicians who have the guts are important. Support of the municipality is also necessary. The government has different roles: facilitating, conducting and regulating. *“(...) if the government does not decides [about clustering of greenhouses] (...) then there never will be clustering (...) because if that aspect is not dealt with, every entrepreneur seeks just for the cheapest solution, and that is, to buy directly [land] from a farmer, to ask for a licence and to build a greenhouse on it.”* Process managers mentioned several times the importance of freedom: the importance of flexibility in contrast with over-regulation.

“Conducting, in sense of accommodating, by not prescribing but sharing with each other, the friends will do the job for you.” Government can regulate what you have to achieve, not how to achieve it.

E. Support of stakeholders

To get support of the stakeholders there needs to be a shared or congruent urgency, an important issue that has to be solved. *“And we told them: if you want to get a real stake in the process, then you need to help also solving their problems where those others are also coping with. (...) Ideas, and also a dialogue with each other”*

Support of the local community is also important. A transparent communication, dialogue and listening to the needs, uncertainties and objections of the environment is very important. If they experience they are taken seriously.

“If someone has a problem or complaining, then we invite them to come over, or we go to their home.”

Further the image is important. *“A lot of initiatives failed because they came in the wrong way in the media.”*

F. Collaboration

“There should really be advantages, otherwise it will become a burden and it will be expensive too. Something you do together, which does not have to be collective, will always be more expensive because you have to debate etc.”

It is not because gardeners are together in a spatial cluster, that they have to do everything together. There needs to be urgency, or a substantial benefit for it.

“So clustering is not a purpose for its own sake, it is a means to be more sustainable or cheaper. And you should take care that the means does not become the purpose. And with policymakers, this image is very vivid, because big collective systems, they are fund of it in general. So it is really important to look at the purpose, not the means”

G. Process specific parameters

Velocity and dynamics of a process can reduce uncertainty, a switch from thinking and talking to doing. As already mentioned, flexibility is important, together with creativity and trust to work out different aspects.

If new problems arise, it is better to deal with them fast. Another aspect is to have the right persons in the right place. Besides other conditions, it is important which persons are sitting around the table. *“... and now deputy B is responsible, he is a new very ambitious man, who wants to achieve something and who in the same context can make things happen, and nothing has changed, but one person, but he is crucial in this process”* The process needs an inspirator, who really goes for it as well as a collaborating group.

IV. CONCLUSIONS

As research is still ongoing, only preliminary findings can be presented. As sampling takes place in different phases of the research, data sampling is not as balanced only after the first phase. Interviews are not yet carried out in all selected areas. Therefore, now, there can be bias because the dominance of one case.

Factors that are found to influence greenhouse park development in the Netherlands are “Related activities in the neighbourhood”, “Land”, “Financial conditions”, “Role of different policy levels”, “Support of stakeholders”, “Collaboration” and “Process specific parameters”. Dependent on differing factors, the process to develop

greenhouse parks can be considered as very complex. It is clear that there are relations between the factors, which will be disclosed from the data as theory will emerge after deeper analysis. More detailed results will be available at the congress.

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