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A systemic project for a local fruit farm and the valorisation of by-products

A case study of a micro-enterprise in Piedmont, Italy

Ferrero Enrica, Ferrero Giulia, Ghignone Elisa, Motta Martina, Ruffa Marco

Covid-19 recalled the importance of local products and the limitations of globalized agriculture, food and health, questioning current production methods. In the fruit sector, traditional and organic crops are being rediscovered, but these must be confronted with the aesthetic standards of the current market, which generates significant amounts of second-rate fruit. These are fruits which cannot be sold because their appearance does not meet aesthetic standards and therefore companies have to make other uses of them. Climate change also affects the amount of second-rate and non-edible food, increasing food waste throughout the supply chain. Systemic design can therefore fit in not only to plan a reuse of these foods, but also to create new value on the territory. Understanding the specificities of the area and the actors involved is essential to define new opportunities and adapt the systemic design.

As a case study, the farm Magnarosa was explored as part of the Open System course of the "Aurelio Peccei" Master's Degree in Systemic Design at the Politecnico di Torino. The farm is located in a small rural area in Piedmont, Italy, with a very strong identity. It is a young, family-run micro enterprise specialised in organic production, mainly of fruit.

Keywords: Systemic Design, Holistic Diagnosis, Agricultural Sector, Ecosystem services, micro enterprises

Introduction

The agricultural sector is strongly related to the logic of the big market, which prefers long supply chains and products with very strict aesthetic standards, particularly in the fruit sector. Therefore, farmers have to deal with large quantities of second-rate products and production waste. Covid-19 showed us the weaknesses and paradoxes of this system, exacerbated by climate change. Systemic design can respond to these critical issues by enhancing the value of local products and territory and helping in the transition to more sustainable supply chains.

This paper presents the research for the realization of a systemic project with the Magnarosa farm (Piedmont, Italy). It is proposed as a case study in a very restricted local context, strongly linked to the territory and local production. The project originated from the Open System course of the Master's degree in Systemic Design "Aurelio Peccei" of the Politecnico di Torino, in collaboration with a young local company characterized by organic production, care for the territory and for social issues. Its proactive attitude and openness to innovation have represented a fertile context to create a dialogue between designers and company, an essential requirement to fully understand the project's context of development.

Systemic Design Methodology

The methodology follows the Systemic Design Approach, an iterative process in which the steps influence each other. The Holistic Diagnosis allows to create a big picture of the territory and the company, used to define the Challenges to respond to and the unexpressed and emerged Opportunities. The collected Solutions are evaluated through a Multi-criteria analysis to select the optimal ones for the specific context. The Systemic project designs

relationships, flows, partners involved, and timing of the various actions creating value. The approach concludes with an evaluation of project Outcomes and future implementation steps. (Barbero, 2017)

Holistic analysis of the territory

Magnarosa is a small business. In order to carry out the holistic analysis, the territory of reference was specifically selected within a radius of 8-10 km. The boundaries considered include three municipalities in the province of Cuneo (Barge, Bagnolo Piemonte and Envie) and one in the province of Turin (Cavour), located in the area surrounding the company and included in the Infernotto Valley.

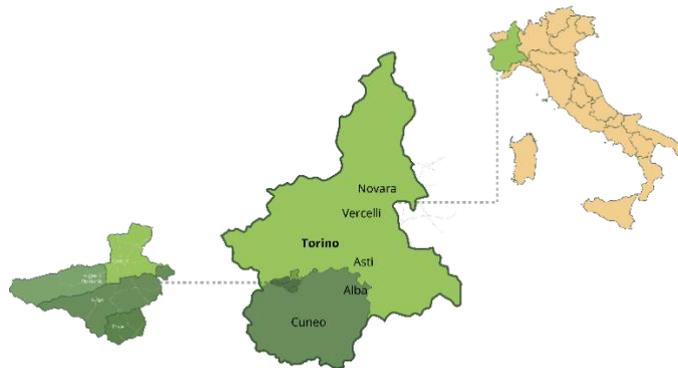


Figure 1. Location of area analyzed in comparison to Piedmont and Italy

The area has a mainly hilly morphology, and it is located at the foot of Mount Bracco, where there is also a small natural park, Rocca di Cavour.

The total population of the area is 21,000. Barge, where Magnarosa is located, is the most densely populated municipality. (tuttitalia.it, n.d.)

Furthermore, the area is home to the second largest Chinese community in Europe, as a consequence of a strong migration at the end of the last century from a Chinese region specialised in stone-working, Zijiang (Chambra D'òc, n.d.). It was precisely the presence of a territory similar to the motherland, rich in quarries of Quartzite or Bargiolina stone, that linked the Infernotto Valley to the homeland of the nascent community.

The other main sector of the area is agriculture, with orchards in particular. The area is rich of historical and cultural events, such as fairs presenting typical local products, and various tourist routes and itineraries to discover local goods, as wines and apples.

Agriculture is the main sector of the area, together with animal husbandry. The percentage of micro enterprises with less than 10 employees, which are 94% of the total number of enterprises in the territory (Censimento Industria Servizi Istat, 2011), confirms the local dimension of the area considered.

This area has a lower-than-average age: this is due to the fact that many businesses are family owned and therefore run also by young people. Moreover, the area has many schools concerning gastronomy and agriculture.

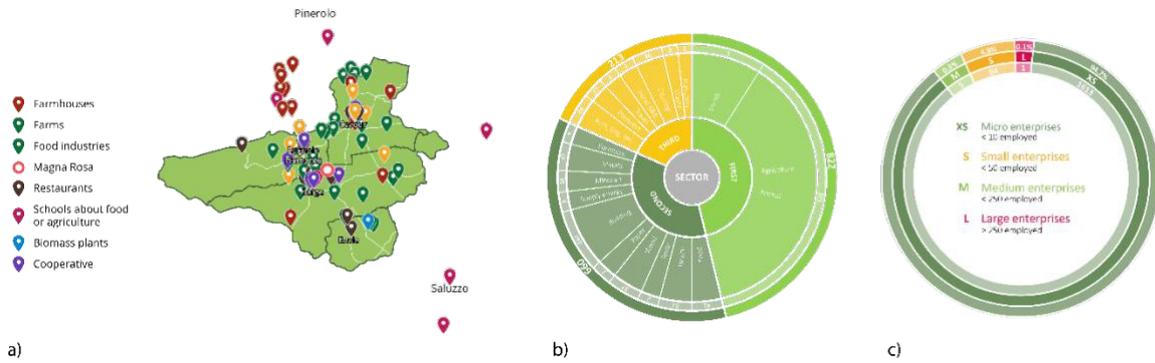


Figure 2. a) Territory mapping of realities related to the company's sector, b) Companies divided by productive sectors, c) Size of enterprises

The main local products are cereals, fruit, nuts and mushrooms harvested in the mountain areas. The area's morphology is particularly suitable for this type of cultivation. Magnarosa produces mainly apples, hazelnuts and blueberries, with small numbers of pears, chestnuts and grapes.

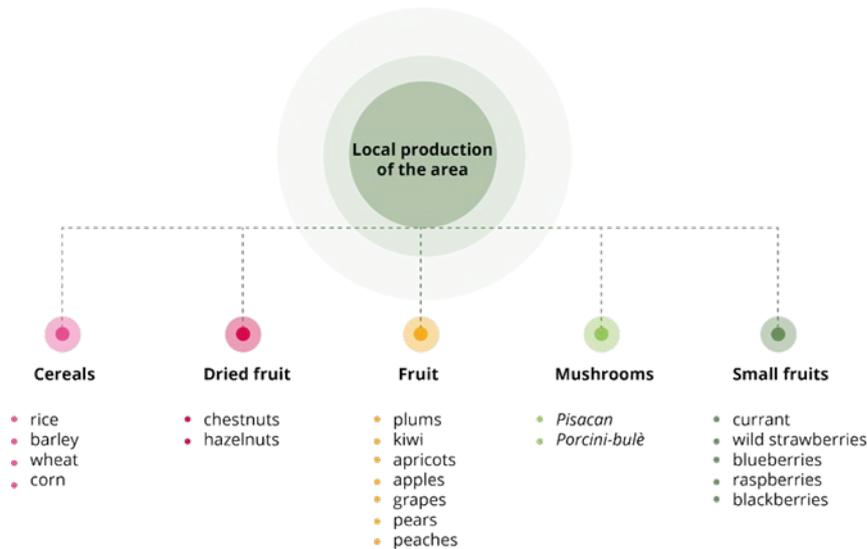


Figure 3. Differentiation of local productions in the area

Holistic analysis of Magnarosa

Magnarosa farm is located within the triad of municipalities of Bagnolo Piemonte, Barge and Cavour, in the province of Cuneo. The small, family-run business, despite its few years of activity, boasts an important responsibility in terms of sustainable production and an ethical attitude towards the environment. The crops produced are grown organically, with the aim of intervening in terms of treatments and mechanical work as little as possible, to keep the natural ecosystem active. This leads to fruit productions of pears, apples, blueberries, hazelnuts and chestnuts, in the total absence of chemical herbicides or pesticides. The most important and ancient cultivars of the company are apples, such as the "Bella di Barge" variety.

On the one hand, the company's attitude is based on the traditional knowledge imparted by Aunt Rosa's family, from which the name Magnarosa derives; on the other hand, it adopts a glocal vision, strongly enterprising, attentive to the needs of the territory and always willing to update itself.

In addition to the zero-km production of crops, the Magnarosa farm is also a holiday farm for a stay surrounded by nature. This reality is one of the first to have brought the BIO concept to Barge and the surrounding area, with the hope of providing a new vision: exporting a local project to the global dimension, thus making it scalable and replicable.

The company's projects are continually evolving and the most visionary ones include the launch of a start-up capable of coordinating waste from apple production to the cosmetics sector, and a start-up of the first protective forest in the Piedmont region.

Thanks to the enterprising vision of the young people working behind Magnarosa, the farm has built prolific relationships with other local and non-local entities over the years, to expand its sales network, online as well, and to join various projects. These include Reynaldi Cosmetics, with which the company is linked to start the production cycle of BIO cosmetics, and "Il Frutto Permessso", which processes raw materials from Magnarosa, such as apple juice.

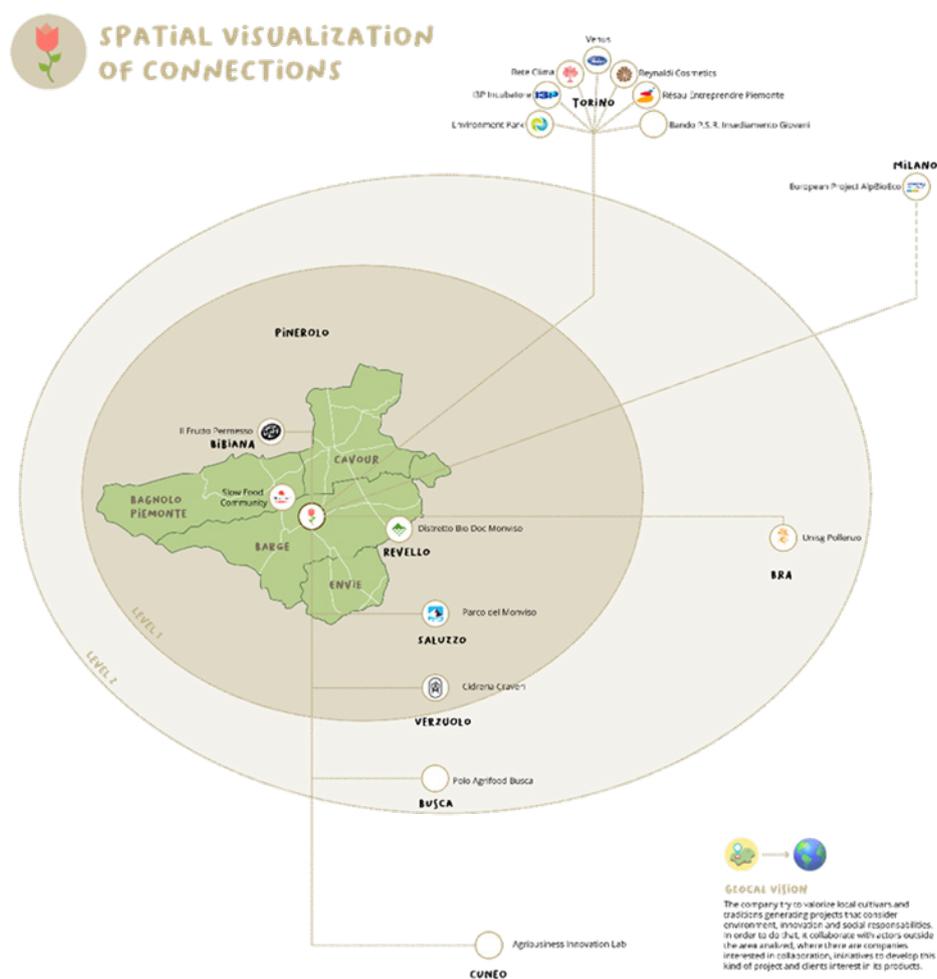


Figure 4. Spatial visualization of local connections related to Magnarosa

Challenges and opportunities

For the definition of the challenges-opportunities' system related to the territory and the company, the general impact of the agricultural sector was taken into consideration, in order to fully understand the problems, both in terms of intensive agriculture and of exploitation of human capital. (Sinatti, 2019)

A first important step of the project was the contextualisation, and the subsequent justification, of some perceptions and qualitative feedback reported by the Magnarosa company, related to the territory. For example, if the impression was that there was little interest in collaboration between small local realities, this was due to the difficulties encountered by companies in establishing relations in the absence of calls for tenders or external funding. Moreover, the Magnarosa company perceived a limited open-mindedness from small entities in the area. This was due to a low participation of the latter in training as agricultural operators (12%), because of a low awareness of the value of training on issues, also related to the environmental impact of the agricultural sector (IRES Piemonte, 2017).

Furthermore, when analysing the barriers encountered in the project, one of the most significant was the coordination of the three phases of research, brainstorming and design thinking, crossed by the group members, which took place entirely remotely. In addition to this, establishing a proper dialogue with the company itself has been challenging. In order to create a sense of mutual trust, and to work in synergy, defining a project suitable for the company's size was the priority.

In this respect, Magnarosa's entrepreneurial reality proved to be immediately available and open to discussion, despite the initial difficulty in understanding systemic project logic, especially in certain phases.

An important limiting factor of the company is its young age: although it is a highly enterprising reality with a strong incentive for innovation, it does have some limits in terms of economic availability, partly caused by the advent of the pandemic, which forced the temporary closure of the farmhouse.

The aim is therefore to propose economically viable and sustainable solutions, even in the long term, possibly taking advantage of external opportunities such as calls for tender organized in the area, or funding.

The innate open-mindedness of the small entrepreneurial reality offers various possibilities for action, some of which have already been undertaken, such as the launch of the start-up Vortex, others are in progress, and others are still to be developed in the near future.

The critical points of the territory - economic, cultural, social and environmental - were compared, and weighted according to different values, and then cross-referenced with those specific to the company. Among the main critical points highlighted - coming from the analysis of the production flows, of the transformation processes of products and by-products, and from the network of relations present in the territory- the following should be considered:

- the important quantity of second-grade apples, partly coming from non-edible percentages of the harvest (5%, equal to about 37.5 quintals per year), partly from a selection that cannot be sold due to poor aesthetic qualities (up to 70%, equal to 105 quintals per year). The big market of fruit and vegetable imposes strict quality standards, which exclude large quantities of fruit and vegetables from the sales system, due to colour, shape, size, weight considered unsuitable.
- the strong dependence of the farm's production on climatic effects, or the possible presence of pests, also considering the absence of appropriate anti-hail nets, due to their high costs. This leads to significant crop instability, resulting in a considerable impact on sales and incomes.
- the limited active relations in the territory between micro-enterprises belonging to the same production sector.

With regard to the opportunities for the development of the systemic project, it is important that these take into account the feasibility and the resources that the territory, together with the company, is able to offer.

Speaking in terms of reusing apple waste, the pomace can be used in various transformation processes for possible productions, such as snacks and biscuits, baby food, flavored craft beers, yoghurt, jams, sorbets, fruit pulp or soaps. While the dry part, consisting of cuticles, can be used for paper and the development of textile fibers.

To cope with the pressure of possible pests or adverse climatic events, the company can seize the opportunity to participate in calls for tenders in the Piedmont region, which would allow up to 80% financing of protective insect nets, or study the insertion of friendly insects and bats that feed on these pests.

Finally, in order to encourage greater relations and communication between the small local authorities, it is possible to develop activities that promote local tourism: tasting sessions of typical products, mountain itineraries and excursions, or even educational courses for children, involving agricultural and hotel schools.

Multi-criteria analysis

The future steps of the project will include the final choice of the most suitable solution for the context and the farm, in order to realise a project that fulfils the five points of the systemic approach. (Barbero, 2017)

A further criterion to be taken into account will be the economic feasibility of the intervention, assessed in parallel with Magnarosa's propensity create additional links with local actors. The aim is to develop a project that places man at the centre, capable of maintaining and regulating himself, in order to enhance the relationships with the territory.

Conclusions and future steps

In order to carry out the systemic project, it was necessary to get inside the specific context of reference, understanding the peculiarities of the company and its relations with the territory. Thanks to the easy dialogue developed with Magnarosa, a further understanding of the local know-how took place, enriched at the same time by the team's research of skills in the field.

The project, the confrontation with the company, and the active research using a desk and field approach, allowed the designers to reach a new level of awareness, fully understanding the steps and sensitivity required to develop a value creation project. As a first experience in the field, and according to this type of approach, the collaboration has brought to light different competences, contributing to the development of the final project outputs.

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