



Faculty of Design

2021

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Marchesi, Alice, Moldovan, Denisa, Puglielli, Mariapaola, Troppino, Martina, Tonelli, William and Wu, Xinwei

Suggested citation:

Marchesi, Alice, Moldovan, Denisa, Puglielli, Mariapaola, Troppino, Martina, Tonelli, William and Wu, Xinwei (2021) Acting on a Company to Relaunch a Territory: The application of the systemic design methodology. In: Proceedings of Relating Systems Thinking and Design (RSD10) 2021 Symposium, 2-6 Nov 2021, Delft, The Netherlands. Available at <http://openresearch.ocadu.ca/id/eprint/3834/>

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Acting on a company to relaunch a territory: the application of the Systemic Design Methodology.

A case study in the province of Biella, Italy.

Alice Marchesi, Denisa Moldovan, Mariapaola Puglielli, Martina Troppino, William Tonelli, Xinwei Wu

A company that relates in all aspects to its territory, responds directly and indirectly to every change of it. When the well-being of the territory is lacking due to external or internal forces, the company is also subjected to the difficulties that this entails. In a period strongly characterized by unforeseen environmental events, companies must be able to develop resilient behaviour, to face any scenario.

With this awareness, the Systemic Design methodology is able to highlight the relationships between the territory and a company, give an overview of this network and through a transdisciplinary method, design practical solutions.

The methodology has been applied, in the specific case, to study the industrial activity of a dairy farm in Biella province, an area seriously affected by economic crises, which needs to establish a new balance and enhance itself. The approach aims to expand the network of relationships that bind the two systems for mutual reinforcement. Finally, the process merged into three fields of action that affect environmental, economic, and social issues: the use of tangible and intangible resources, the value of by-products and the awareness of the community that lives in these places.

Keywords: Systemic Design; dairy company; territorial enhancement; process efficiency; communication.

Introduction

This research aims to demonstrate how the Systemic Design (SD) methodology can be a successful tool to **highlight the relationships between a company and its territory, to enhance mutual development.**

It is allowed thanks to the modality of SD to deal with scenarios with a high degree of complexity: the transdisciplinary approach needs to create a horizontal dialogue among parts, to design systemic and multiple interconnected solutions. From the Holistic Theory, SD maintains the assertion in which the whole is more than the sum of its single parts. In particular, the way of thinking enterprises as a part of a whole helps to find innovative and sustainable solutions with the participation of the territorial actors. This concept overcomes the idea that a single entity is enough for itself, showing how the development of one brings shared wealth.

A company that is born and remains for years in the same territory, lives the transformations that it undergoes. In times of growth, both benefit from cultural, social, and economic wealth; as well as a territory in crisis affects the companies that inhabit it. “This involves recognizing the nature of firms not only as legally bounded entities and owners of proprietary assets (both tangible and intangible) but also as institutions with permeable and highly blurred boundaries—in other words, conceptualizing them as “networks within networks” or “systems within systems.” (Dicken & Malmberg, 2001).

Enacting the Systemic Design methodology for a specific case study

A specific case study concerns Caseificio Rosso, a historical company that produces cheese. The company is rooted in the province of Biella, where Rosa Pidello Rosso in 1894 started the business; still, now it is a family-run enterprise (biella.cna.it, 2020).

To act with a systemic approach to the company, it was essential to carry out a Holistic Diagnosis, first of the territory and then of the company. To analyze the territorial system, demographic, geographic, economic,

historical, and cultural data has been gathered from reliable sources into a shared datasheet. While the study of the enterprise has been articulated through the comprehension of the corporate structure, and its history; then the production line, the assets, the markets, and the competitors. This means a large amount of data collection, which framed the state of art of the two networks. Once processed, data led to some considerations. The Challenges of the two fields of action highlight problems and possible common paths, which can turn out into Opportunities. First, through desk research, potential case studies arising from such issues have been identified. To understand which Opportunities to carry out in our studies and transform them into strategies of action, Multi-criteria analysis has been the selection tool, thanks to which each item has been evaluated according to common parameters: Feasibility, Impact on the territory, Economic impact, Systemic Design Principles (Autopoiesis, Human-centred Design, Outputs into Inputs, Relationships, Act locally). The specific solution of a problem must always be measured with the will of the company and the needs and limits of the territory. The role of mediators of designers is here more than in other moments, fundamental to open the dialogue between all the actors (Barbero, 2017; Barbero, 2021).

General overview of the territory

The province of Biella, with a population of 174.170, is distributed in 74 municipalities (tuttitalia.it, 2021). This territory is characterized by a particular morphology: it is in fact subdivided into three parts almost equal between mountains, hills, and flatlands; with 40% of soil covered by forests and only 0,7% by superficial water. (data from geoportale.piemonte.it, 2019 processed by the authors with a Geographic Information System program). The area is therefore characterized by an urban distribution that follows the location of the valleys and their respective waterways. During the industrial expansion, until today the province is strongly characterized by the harmonious coexistence between man and nature.

The predominantly mountainous topography has not favored agriculture but has preferred animal breeding. Since the XV century, small landowners played a key role, in which having animals allowed the inhabitants of valleys, in a vision of self-sufficiency, on one hand, to raise their own livestock, and on the other, to be able to work wool and fabrics on their own properties (lanediabella.com, n.d). Still, now, the primary sector is composed of **37% of the enterprises dedicated to farming**. The second sector is instead subdivided into equal parts between building and manufacturing. In the manufacturing sector, the textile district corresponds to 17% of the whole. Its turnover amounts to € 8.905.004 per year (business.bigprofiles.it, 2019a), and the export to € 1456.58 million (Camera di Commercio di Biella, 2019). The **textile sector** has always been the great power of Biella territory and the main source of income. For this reason, the province has never had to advertise itself and has never tried to develop other sectors and new job opportunities. Moreover, the latest researches show that this **economic monopoly has led to a long-term impoverishment of other sectors** (Regione Piemonte & POLI Design, 2015).

The **agri-food sector** is smaller, with 3% of the total with € 2,565,566 revenue per year (business.bigprofiles.it, 2019b), boasts beer industries, including Menabrea S.p.a. and dairy industries, and water ones, like Lauretana S.p.a.

The territory is the common starting point of these districts. The **peculiar morphology** of the Alps is the ideal condition to raise an economy based on animal industry. Moreover, **water resources** are restrained, but with excellent qualities (with low-fixed residue) that reflect both in the softness of fabrics and tasty milk. In recent years, however, there have been phenomena of water scarcity, and reduction of quality in the main waterways of the area. These circumstances are due to the historical presence in the territory of textile industries that used to throw wastewater directly into rivers. Since 1979, Cordar Consortium has managed the purification treatments of industrial wastewater.

However, the two sectors had very different developments: textile became the most typical sector of the region, while the agri-food sector remained mainly marginal and tied to its traditions. Today, the textile sector is less strong than in the past and Biella has lost the epithet of *Manchester of Italy* (Regione Piemonte & POLI Design, 2015). Moreover, historical, and various economic researches show a pattern comparing the two districts trends: over the years, the number of textile industries has fallen dramatically, but the food industry has always maintained a certain balance. This is especially evident with the arrival of the crisis in 2008, which most affected the textile industries. This situation led to several connected problems: factory abandonment, lack of labor opportunities, depopulation and decrease of young people inhabitants, and land abandonment. The crisis occurred in parallel with the crumbling of the formal relations between the economic and cultural realities that inhabited it. So, now, the first need of the territory is to renew and promote itself.

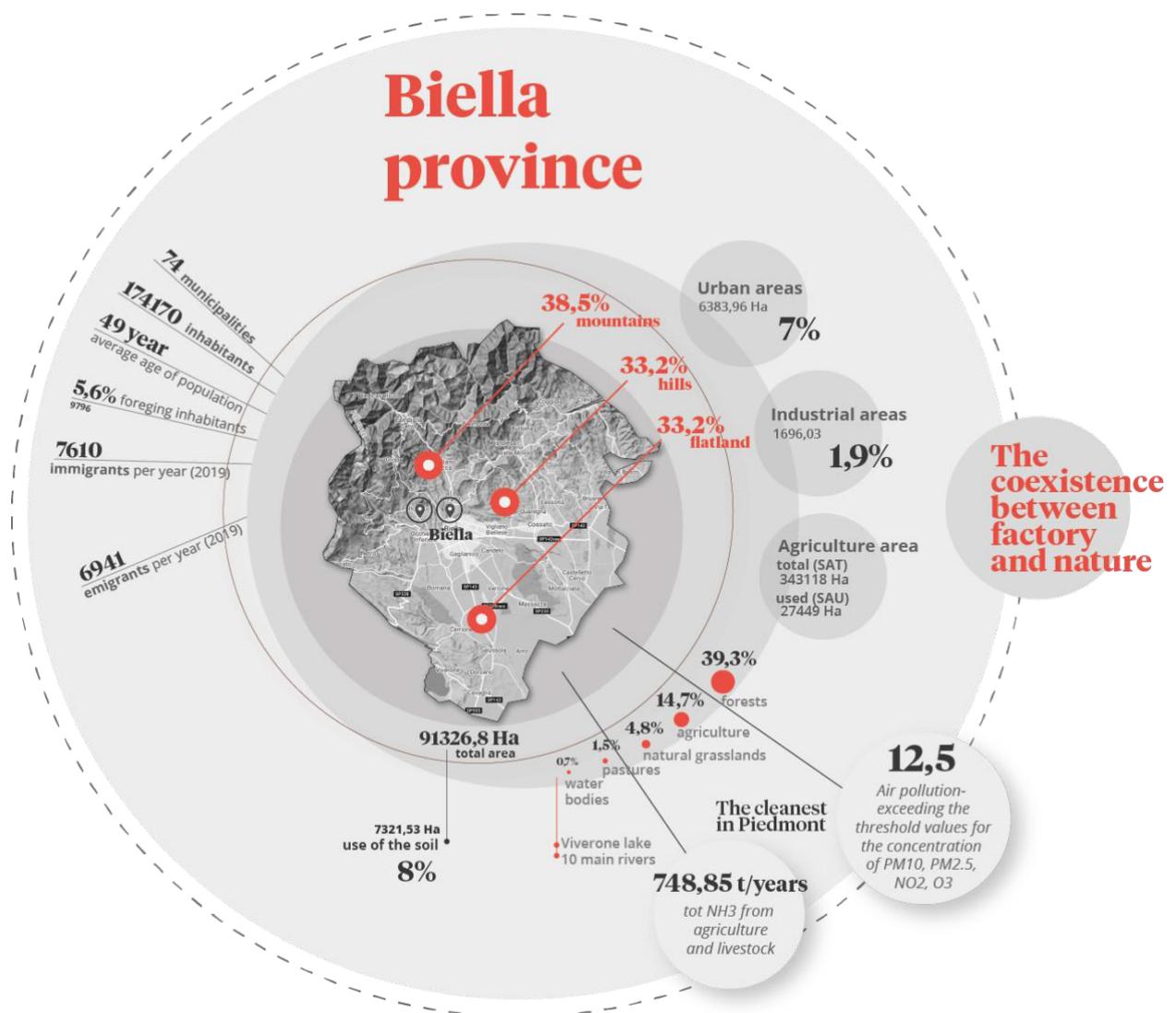


Figure 1. Relevant data of the Province of Biella (Source: Authors).

Specific overview of the dairy company

Caseificio Pier Luigi Rosso was born in the middle of the Biella Alps, where Oropa Valley meets Cervo Valley. The fourth generation of the Rosso family is the manager of the dairy, a small reality of 14 employees. The Company has two different plants: the administrative office and the production site are located in Biella (BI), where the milk is processed to become cheese. Just 7 kilometers away, in Pollone (BI), the employees carry out the ripening phase and manage the delivery trucks; next to the plant, there is also a tiny shop for direct sales. The possibility to follow the production, from the acquisition of the raw materials to the conclusion of the aging, allows Caseificio Rosso to **ensure the highest quality** and consistency of the finished product in **full respect of the tradition**. During the century, the company **acted locally**, tightening a close network of local suppliers.

They sell their products locally and export through Italian-large distributors, always maintaining the high quality of the products (Enrico Rosso's Interview, 2021).

The **cheese production process** starts from the milk collecting and ends with the sale of the products. Milk is collected six days a week from local producers and, in autumn, by additional two Piedmontese producers located outside the province. During the process, the milk releases 80% of it in **whey**, a liquid by-product rich in nutrients, that the company sells to a pig farm in the same area. Since the whey contains a high quantity of lactose and proteins, if thrown away, it constitutes an abundant waste of food resources, and worst, if not treated well, it damages the soil.

Another **relevant input is constituted by the water**, not only for the processing but also for the frequent cleaning phases. The quantity of water per month is almost 300.000 liters. The water, once used, must be purified because it does not only contain organic components but also chemical cleaning agents. For that, comes into action Cordar Consortium: the society that manages the industrial exhaust system, a network of pipes created for the disposal of wastewater from industries. This infrastructure has a significant role in the reuse of wastewater, which, if released in the environment before treatments, can affect nutrient cycling and the development of diseases. Despite the contribution of the Consortium, the water does not return to its initial degree of purity (Consortio Cordar, 2014a; Consortio Cordar, 2014b).

Finally, it is important to mention the amount of energy necessary for the entire cheese-making process. In particular, the most energy-consuming phases of the process are the pasteurization of 90% of milk, and the ripening phase, which involves four different cold rooms for an average period of around 60 days for cheese. Solar panels installed in the two plants produce part of the energy needed, while the rest is from fossil fuel sources. Non-renewable energy input transforms into air pollutants output that influences the air quality and climate regulation, and indirectly on human health.

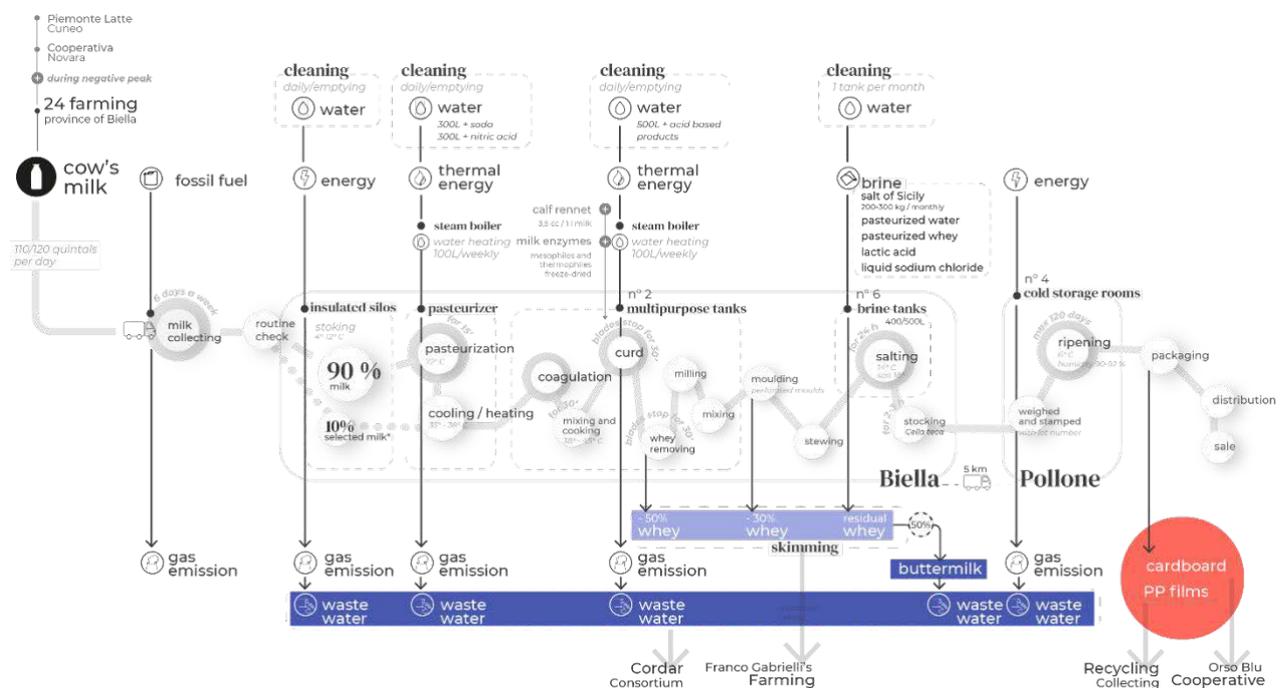


Figure 2. Productive process of the company (Source: Authors).

Cross-cutting research to define strategies

From The Holistic Diagnosis of both the territory and the company, several factors emerged as critical and some others as potential opportunities and strength. The key was to draw links among all the points to read the set of nodes as the same network.

The action plan aims to **enhance the use of the resources** (1), to **bring value to by-products** (2) and to **communicate the strong know-how behind the final product and its territory** (3).

1- More specifically, the first area of interest concerns **water**. The high consumption of the resource in the productive process collides with the scarcity of water in the area (Provincia di Biella, 2019). The applied strategy touches 3 different points: reducing the volume of water through physical tools like low-volume/high-pressure nozzles; raising awareness among employees, in order to acquire a pro-environmental behaviour, also as citizens (Wells et al., 2016) with the visualization of the quantity of water they use daily. Finally, water scarcity of the territory is communicated outside the dairy thanks to infographics, displays, social media and events.

2- The **organic waste is an output of the process that, for now, represents the 80% of total waste sent to the municipal service disposal**. It can be **re-introduced in the system** as a fertilizer component through

shared treatment among multiple users nearby, in a form of collective composting management. This shared action is, moreover, permits to **create relations** with other actors and the territorial spaces.

3- The textile crisis has taken away the international recognition of the industrial value of the province of Biella. **Districts still alive can tell the territory and its history** again. For this, a direct communication on the products of the dairy can have a marketing function for the company and mouthpiece of the province. This can be realized in the form of tangible actions (through material and graphics of packaging). Cotton scraps from the textile sector are used as the primary packaging for a part of the dairy's production. The material would add value on several levels through the use of material that becomes a resource from waste, through the differentiation of Caseificio Rosso's products on the market, and through the enhancement of the informal relationships existing between local entrepreneurs, in addition to being a material that guarantees optimal conservation of the cheese.

Conclusions

The project started with the idea of acting with a systemic approach on the selected company. The methodology used allowed us, through qualitative and quantitative data, to obtain a holistic view of the company and the territory in which it operates, from which emerged common challenges: we discovered the strength of the link between Caseificio Rosso and the province of Biella in which it operates and how the needs of one meet the needs of the other.

It follows that the **methodology of Systemic Design applied to a business reality enhances the company-territory feedback loop**.

The effectiveness of this approach is to relaunch the company based on, first of all, going to make the production process more efficient and re-evaluate its resources, whether these are raw materials or by-products that the company produces. Through a material (output>input) and immaterial flow, different realities can link together; as punctual gestures (such as plant modification) could initiate deeper cultural transformations (starting from employees) that can reach, in a long term, macro-scale actions. Concurrently, the company could take advantage of the context and become stronger starting from the strengths or weaknesses of the territory. Local peculiarities lead to the design of unique solutions, such as to trigger positive effects on the business reality. These favorable impacts resonate in the territory, closing (and starting) the exchange of inputs and outputs of the whole system.

References

Barbero, S. (2017). Systemic Design Method Guide for Policymaking: a Circular Europe on the Way. Allemandi. <http://porto.polito.it/2685125/>

Barbero, S. (2021, April 24). Systemic Design - Unit 1: Holistic Diagnosis methodology. Retrieved from <https://www.youtube.com/watch?v=d7JArZGRMWY> [accessed on 25 Apr 2021]

Giraldo Nohra, C., Pereno, A., & Barbero, S. (2020). Systemic Design for Policy-Making: Towards the Next Circular Regions. *Sustainability* 2020, 12(11), 4494. <https://doi.org/10.3390/su12114494>

biella.cna.it (2020) Retrieved from <https://www.biella.cna.it/blog/caseificio-rosso/> [accessed on 13 Apr 2021]

business.bigprofiles.it (2019a). Retrieved from <https://business.bigprofiles.it/companies/BI/13> [accessed on 6 Apr 2021]

business.bigprofiles.it (2019b). Retrieved from <https://business.bigprofiles.it/companies/BI/10> [accessed on 6 Apr 2021]

Camera di Commercio di Biella. (2019) Scambi con l'estero. *Economia Biellese*, 13. http://images.bi.camcom.it/f/StudiPubblicazioni/StudiPubblicazioni2020/10/10790_CCIAABI_2372020.pdf

Conosrzio Cordar. (2014a). Impianto di Biella Nord. Linea acqua- valori analitici medi annuale. <http://www.cordarbiella.it/servizi/depurazione/dati-di-gestione-impianti-di-depurazione/> [accessed on 29 Mar 2021]

Conosrzio Cordar. (2014b). Impianto di Biella Sud. Linea acqua- valori analitici medi annuale. <http://www.cordarbiella.it/servizi/depurazione/dati-di-gestione-impianti-di-depurazione/> [accessed 29 Mar 2021]

Dicken, P., & Malmberg, A. (2001). Firms in Territories: A Relational Perspective. *Economic Geography* 77,4: 345-63. Ragnatela. <https://doi.org/10.1111/j.1944-8287.2001.tb00169.x>

Enrico Rosso's Interview, (2021, March 26).

geoportale.piemonte.it (2019) Retrieved March 24, 2021, from
<http://www.geoportale.piemonte.it/geonetworkrp/srv/ita/metadata.show?id=2531&currTab=rndt>,
<http://www.geoportale.piemonte.it/geonetworkrp/srv/ita/metadata.show?id=2531&currTab=rndt>,
<http://www.geoportale.piemonte.it/geonetworkrp/srv/ita/metadata.show?id=2531&currTab=rndt>,
<http://www.geoportale.piemonte.it/geonetworkrp/srv/ita/metadata.show?id=2531&currTab=rndt>

lanedibiella.com (n.d). Retrieved from <https://www.lanedibiella.com/biella-e-filati/> [accessed on 5 Apr 2021]

Provincia di Biella (2009). Piano Territoriale Provinciale-Variante n.1°. *Rapporto Ambientale*, Chapter 3.
<http://public.provincia.biella.it/VARIANTE%20N%201%20AL%20PTP%20-%20RAPPORTO%20AMBIENTALE/RapportoAmbientale.pdf>

Ramaschiello, V. (2015). Defining agro-industry: a statistical classification approach. *FAO- Defining agro-industry: a statistical classification approach*, 16.
[http://www.fao.org/fileadmin/templates/ess/documents/meetings_and_workshops/faounido/4.d. Defining A groIndustry A Statistical Classification Perspective.pdf](http://www.fao.org/fileadmin/templates/ess/documents/meetings_and_workshops/faounido/4.d._Defining_AgroIndustry_A_Statistical_Classification_Perspective.pdf)

Regione Piemonte, & POLI.Design, (2015). Biella, fabbrica culturale e creativa.
http://www.comune.biella.it/sito/file/porfesr14-20/SdF_Biella.pdf

tuttitalia.it. (2021). Comuni Provincia di Biella. Retrieved March 10, 2021, from
<https://www.tuttitalia.it/piemonte/provincia-di-biella/29-comuni/>

Wells, V. K., Taheri, B., Gregory-Smith, D., & Manika, D. (2016). The role of generativity and attitudes on employees home and workplace water and energy saving behaviours. *Tourism Management* (1982), 56, 63-74.
<https://doi.org/10.1016/j.tourman.2016.03.027>