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The Community Gardening Project in Belo Horizonte: practicing systemic networks, agroecology and solidarity economy

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ABSTRACT

Nowadays, most of the Brazilian population is living in cities, and slums are growing with poor living conditions, in a context of enormous social-economic inequality. One of the local challenges is the poor nutrition of its inhabitants, along with the high cost of healthier food. This paper presents the results of an urban gardening project, developed through the partnership of universities, communities and public institutions at the city of Belo Horizonte, Minas Gerais. It represents university research and extension projects on building community gardens, aiming at the constitution of a social-economic innovative process to increase local social cohesion, popular protagonism and food sovereignty. Each garden that is part of the Community Gardening Project is facing particular challenges in relation to its social, environmental and economic sustainability, but the initiative is proving to be a significant alternative to humanize those spaces, systemically bringing together approaches as Systemic Design, Agroecology and Food Sovereignty and Solidarity Economy, Integral Endeavours and developing cooperative and innovative actions.

Keywords: Agroecology, Brazilian Communities, Community Gardens, Solidarity Economy, Systemic Design.

INTRODUCTION

World leaders, in September 2015 at a United Nations Summit, have decided to fight against some global long-lasting problems related to poverty, inequality, climate, environmental degradation, prosperity, and peace and justice, proposing the United Nations' Sustainable Development Goals as part of a global agenda fixing some targets for 2030. "Over the next fifteen years, with these new Goals that universally apply to all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind" (United Nations, 2018).

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In this global context, Brazil is facing many challenges due to its long lasting social-economic and environmental problems that deeply affect the everyday lives of their inhabitants. Over the years many efforts have been made, many projects and actions are developed, but the problems persist. In order to deal with these chronic problems, a new approach then is required, since the current traditional emphasis on specialized knowledge is being incapable of tackling these questions efficiently. A systemic approach presents itself as an alternative that offers a fresh road. Its implementation is challenging since it demands cultural changes, requiring the people involved to embrace the complexity of dealing with many variables at once, balancing them to try and find the best fit. Nevertheless, it is a promising strategy, since it is more "life alike".

Systemic Thinking is a way of reasoning that considers the complexity of the whole (Barile et al, 2018), a cognitive process that leads to the capacity of perceiving, modelling and evaluating the consequences of actions in an expanded way in terms of time and space (Andrade, 2014). Systemic Design is one of the methodologies available that presents principles, methods and tools to structure the work using a holistic mode (Bistagnino, 2009; Mendonça, 2014; Jones, 2014). Working with this methodology already for some years has provided the opportunity to put some of its theory into practice and to recognize the complementarities and intersections with other known approaches. Its association with values and concepts that are becoming increasingly widespread, such as the Circular Economy, Agroecology, Social and Solidarity Economy, shows a potential of producing substantial changes in contemporary societies.

Those are subjects that are going to be discussed in this article. It presents the Community Gardening Project, that brings together some cases where communities and the academy get together to deal with issues such as nutrition, economic sustainability and social expression, to modify the social-economic *status quo* of poor communities, looking forward to a better quality of life.

The Gardening Project deals with four community gardens in the city of Belo Horizonte, built by the local residents, with the support of an academic working group, based on solid theoretical concepts, respecting their unique contexts and challenges, which also brings some distinct solutions to each community garden.

Next, the concepts and principles used by the academic working group as foundation of its work will be presented, as well as the motivation of each group to engage in this initiative.

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1. THEORETICAL FUNDAMENTALS

The Community Gardening Project, from the point of view of the universities involved, encompasses research and extension initiatives. Every Brazilian university develops extension projects to fulfil its mission, applying theories and principles that are the fundamentals of professional activities. The referential concepts adopted to guide the interventions include intertwined theoretical frameworks, in tune with Integral Sustainability and Systemic Thinking, mainly with the Systemic Design principles.

All initiatives include land cultivation respecting the precepts of agroecology that, in its holistic character, values and promotes local territorial, cultural and socioeconomic conditions, generating social transformations differentiated by the specificities of the spaces where they take place. In its turn, the option for food sovereignty crowns the agroecological efforts by privileging productive choices that are fruit of local knowledge, both in terms of how to deal with the land and how to value traditional recipes. The productive capacity of the vegetable garden initiatives, implemented involving collaboration and fostering the autonomy of local actors, as they also generate marketable surpluses, calls for the fundamentals of the Solidarity Economy, as it recalls the values of respect for local cultures, and mutuality, non-monetary exchanges or practicing the fair price. Therefore, all actions conducted in the context of the Community Gardening Project are grounded in theories and methodologies that are interrelated.

1.1. Integral Endeavours and Systemic Design

An Integral Endeavour is any organization for productive activity (be it an industry, a household, an individual or the nature) that operates considering the holistic relations among its elements and the concept is grounded on integral sustainable values (that is, activities aiming at having social, economic and environmental resources to provide unlimited duration of its activities). The Integral Endeavour principles are described in our previous works (Mendonça, 2014, 2017, 2019; Mendonça & Martins, 2019) and defines goals and builds networks based on Systemic Design principles: 1) generating zero waste, by using the **output** (waste) of a system as the **input** (resource) of another one, optimizing the use of resources and creating an increase of cash flow and also new job opportunities; 2) identifying and fostering **relationships**, since the components of the network have common values and interests, and due to the recognition of fundamental connections of multiple areas of knowledge and practices, building systemic networks; 3) being **self-productive**, sustaining itself by defining its own paths of action and the joint coevolution of the elements of the system, all of which with equivalent importance; 4) giving special value to the **local**

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context and resources (human, cultural and material), which contribute to solving local problems and to create new opportunities; 5) placing people in the centre of the projects, valuing **people** over products – contributing to the quality of life, fostering inclusion and accessibility of the people, which are considered more important than the production of goods (Bistagnino, 2009; Mendonça, 2014).

Alongside with those principles, Systemic Design is a methodology that offers tools to model the context/ business to be qualitative and quantitatively analysed. First, by representing the system as it currently is to identify the improvement areas from the point of view of Systemic Design principles, and then creating its systemic ideal model, which addresses solutions to the problems and desirable improvements identified. Therefore, its five principles provide the guidelines that must always be considered for planning decisions. In particular, for the Systemic Design methodology there is no notion of centrality. It involves actors who are equally important and may even come from different biological kingdoms (animals, plants, algae, bacteria and fungi), creating "a network of activities and products, focusing on the environmental and cultural protection" (Bistagnino, 2009, Mendonça, 2014). Therefore, the Integral Endeavour mindset differs from the traditional capitalist one, where each business focuses on its own success, by maximizing participation in the market and profit. The existence of an Integral Endeavour is directly related to the composition of a Systemic Network of Integral Endeavours (SNIE). The following Figure 1 shows the representation of an example of an Integral Endeavour and its network.

This means that, when thinking strategically about a business, other businesses that participate in its system are also taken into account, as well as the local environment and resources (human and material), aiming at the well-being of the society as a whole and, as a consequence, promoting sustainable development.

It could be considered that the modelling of a SNIE is an evolution of the widely known "Business Model Canvas" (BMC) (Osterwalder, 2004; Osterwalder & Pigneur, 2010), which is a tool for strategic planning on which it is based. A SNIE, differently from the BMC, instead of creating a map for planning the success of a company and focusing on a central industry and on the goals (mostly economic) of a single business, the rationale behind the SNIE is the optimization of matter and energy, recognizing every output of the system as a resource and stimulating connections, since the resources identified are taken as an opportunity for other businesses. This has the potential to inspire innovative productive Integral Endeavours conceived as part of a network, that brings benefits for human beings and the environment.

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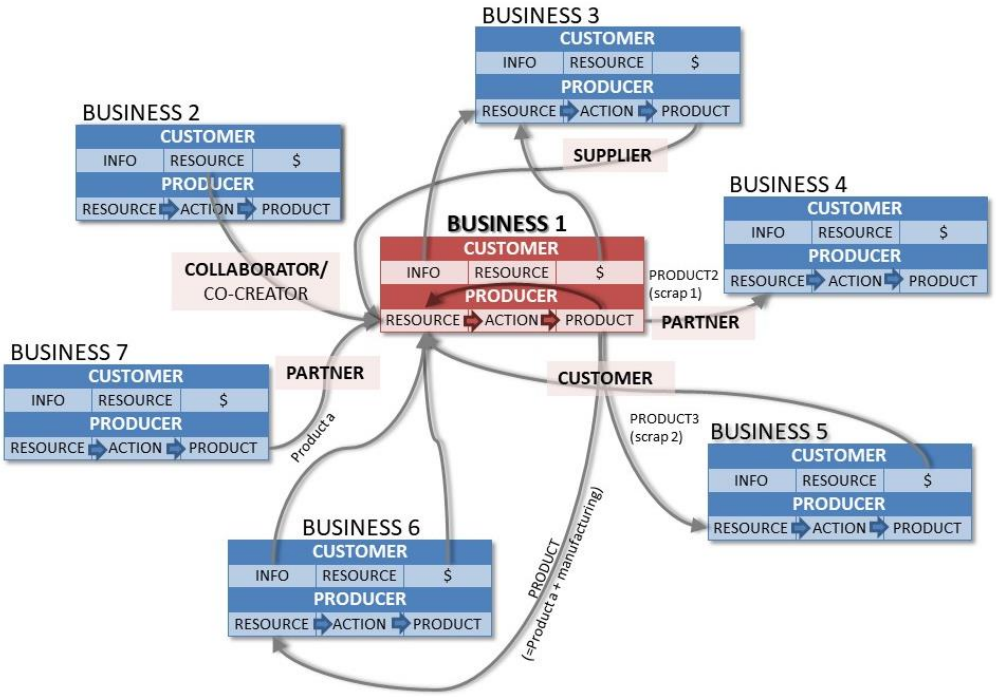

Figure 1. Representation of a SNIE and some possible relationships (Mendonça, 2014)

For the Integral Endeavour it is important to stimulate the conscious consumer. This conscious agent buys what is actually needed (not what the market imposes, be it in quality or in quantity); takes an active part of the network using its valuable knowledge and culture to give feedback about the product or service, as well as acting as a producer. In this network model, producers treat consumers as they would like to be treated, aware that everyone plays both roles and that confidence is essential for positive relationships. This concept is already being practiced in agricultural networks based on Solidarity Economy, grounded in the agroecology principles, where they are called “prosumers”.

The Integral Endeavour mindset has also intersections with the Circular Economy concept that aims to redefine growth decoupling economic activity from the consumption of finite resources by adding efforts to the transition to renewable energy sources having as principles: “design out waste and pollution; keep products and materials in use; regenerate natural systems” (Ellen MacArthur Foundation, 2017).

1.2. Agroecology and Food Sovereignty

Together with the idea of Integral Endeavour, Systemic Principles and Circular Economy, Agroecology is another concept that is central to the Community Gardening Project. It is an

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agricultural practice adapted to the productive requirements of the land available, encompassing the multiplicity of farming forms and adopting ecological solutions in tune with the territorial, cultural and social-economic conditions of each agricultural system (Fernandez et al, 2013, Gliessman, 2015).

It is also qualified by its principles, that maintain the management practices faithful to the natural environments available, contributing to preserve the biodiversity, the natural resources and the local ways of life, building a character of broad sustainability. According to Embrapa (2006) Agroecology aims at fulfilling the economic level (to boost income, work and market insertion), the ecological level (to preserve or increase the quality of the natural resources and the ecological relations of the ecosystems), the social level (to include the poorest and promote food security), the cultural level (to respect the traditional expressions), the political level (to organize changes and the participation on the decisions) and ethical level (to adopt transcendental values). Therefore, it shares the values of Systemic Design, including the holistic approach.

Agroecology offers a theoretical reference that respects the territory, rejecting the use of environmentally harmful agrochemicals and highlighting the importance of the diversity in farming, transforming its principles and practices into reality, also valuing the ancestral sources of knowledge, as an outcome of the popular knowledge (Embrapa, 2006). For these reasons, Agroecology happens throughout a plurality of formats as it encompasses historical gathered knowledge, reinforcing solidarity values and practices and preserving the identity of the local actors.

In Brazil, the propagation and valorisation of the Agroecology principles rescued initiatives that update and improve it as a science, nurtured by the indigenous and agricultural knowledge from different areas (some of those experiences are well presented by Fraxe, Castro & Santiago, 2015). Some non-governmental, governmental and academic organizations are proving fruitful associations between Agroecology and the improvement of Food Security, preserving the sovereignty, the conservation of natural resources and the agricultural diversity of hundreds of rural communities (Altieri, 2004 & 2010).

The concept of food sovereignty arose in the 1990s associated to the Agroecology concept, through the social demands of the Via Campesina association (Rosset & Martínez-Torres, 2013), that gathers peasant organizations around the world, mobilized against neoliberal rural politics recommended by the World Bank and by the World Trade Organization, that were adopted by many governments (Rosset & Martínez-Torres, 2012). It affects the way the

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land is occupied, to produce and commercialize food (Campos & Campos, 2007). It defends the right of autonomy of the countries to deal with its politics and strategies of production, distribution and consumption of food, protecting the small and medium agriculture, coinciding with the basis of the agroecological principles (Burity et al., 2010).

The connection between food sovereignty and food and nutritional safety (conceptualized by the Law 11.346, September 15th, 2006) demands the assurance of the food autonomy of a nation and the implementation of a fair way of food production and distribution compatible with their rights (Burity et al., 2010).

In this sense, "...the extent of the interventions that intend to be materialized at the format of community gardens, within the principles of Solidarity Economy and Agroecology has the potential to reach a complex list of solutions to face the deprivations suffered by (...) communities" (Mello et al, 2018, p.13). Their members, initially excluded or poorly included by the market economy, are then mobilized to participate in an endogenous process, capable of promoting latent resources and knowledge, that can affect not only food sovereignty, but also the achievement of local development.

1.3. Social and Solidarity Economy

Complementing the theoretical framework of this Project is the concept of Solidarity Economy, which has values similar to those of Agroecology and which fits in the framework of Systemic Design. In Brazil, since the end of the 1970s, communities affected with high levels of shortage began to practice the sharing and reciprocity to fulfil certain needs and to improve their quality of life. This has originated a "new economy" (even if manifested worldwide since the Industrial Revolution), with opposite patterns to hegemonic capitalism, called social and Solidarity Economy (Singer, 2001). Within its scope, associative forms to solve public local problems and the mutualism have emerged as a result of a disposition to create a collaborative schema of generalized gain and self-management (Borinelli et al, 2010; Laville, 2010; Ribeiro & Müylder, 2014).

This creates several kinds of organizations that share productive resources and have horizontal productive relations, advocating equal rights, responsibilities and opportunities among the participants (CNES, 2006, in Singer, 2009). Their production tends to be accomplished at networks, broadening the exchanges within the same organizational system (Simon, 2013; Mance, 2009).

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Therefore, this is a pluralistic new model of economy, which encompasses many models of organization (França Filho, 2008; Laville, 2010; Pinheiro, 2016). Despite some variations, these models have convergent principles in respect with the social valorisation of the human work, the use of technological creativity and economic activity driven by the full satisfaction of everyone's needs, the recognition of the importance of the feminine concerning solidarity, the respect for the environment and the emphasis on cooperation and solidarity (FBES, 2005, s/p). All those principles constitute the basis of the Community Gardening Project which aims at contributing for the community to achieve autonomy and protagonism in the decisions, taking care with the valorization of the local culture.

2. THE WORKING GROUP AND THE METHODOLOGY OF THE PROJECT

For this Project, researchers and students from three local universities came together – ED-UEMG, UNA and UFMG – as they all had similar goals in relation to developing academic and extension projects with a relevant social role, constituting an academic working group. The projects were based on community gardens to create a theoretical and practical framework that would be able to expand and consolidate the concepts involved. This coincidence of purposes, verified in the confluence of the projects of the different academic institutions, provided interdisciplinary debates and decisions translated in the initiatives implemented together with the local communities. In this opportunity, the flexibility of the methodology, prioritizing its objective of learning and producing knowledge, through systematic observation during the implementation of the Project, translated into a mediation role in two plans, namely: (1) in the community context, supporting the management of activities and internal conflicts, promoting cooperative and solidarity actions and accessing technicians and professionals from different backgrounds, orienting specific actions; (2) in the relations with the local administration involving both its urban planning institutions, the public enterprise responsible for implementing the municipal popular housing policy, URBEL (*Companhia Urbanizadora e de Habitação de Belo Horizonte*) - interested in protecting the population of informal settlements from the occupation of areas with geological risks and its office responsible to assist people through actions regarding nutrition and food, assuring its quality and quantity, SMASAN (*Secretaria Municipal de Assistência para Segurança Alimentar e Nutricional*). The academic working group's role with these two institutions was to help accommodate their agendas and protocols to the realities of low-income communities to the implementation of the gardens. Thus, the academic institutions, when contributing to settle community difficulties, became the co-builder/ co-transformer of local realities. The projects of each participating university are described next.

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2.1. ED-UEMG

The graduate course in Visual Arts, offered at the Design School of the State University of Minas Gerais (ED-UEMG), trains art teachers of basic education. As required by law, the course has in its program the discipline "Special Topics in Environmental Education". Considering the intertwined nature of the environmental issues to the social and economic aspects and the fundamental goal of increasing integral sustainability, the discipline presents to the students the Systemic Networks of Integral Endeavours, applying the Systemic Design principles. As the discipline is very interactive, with students also bringing their experience to the classroom, some very rich opportunities arise. One of them is the interrelation with extension courses. ED-UEMG offers academic extension activities with short courses on vegetable and flower urban gardens in small spaces that create, within the university, a dialogue on different aspects of Design, product lifecycle, new Economies (such as the Distributed Economy and Sharing Economy), and practices of sustainable actions, also promoting exchanges between the academic community and the society.

2.2. UNA

The University Centre UNA receives projects at its Extension and Research Board, having as selection criteria being committed to sustainable development, as the ones foreseen at the "The Earth Charter", proposed by the United Nations World Commission on Environment and Development, in 1987, and ratified by UNESCO, in 2000. The Earth Charter principles are the basis for the constitution of the LEIA - Laboratório Ecossistêmico Interdisciplinar de Aprendizagem, UNA´s ecosystemic interdisciplinary learning laboratory. LEIA has a social character that integrates teaching, research and extension, bringing together practices and studies of social relations, interdisciplinary knowledge and intersectoral actions. Its objective is to work with people from collective groups, promoting participatory and proactive actions, to "make it happen" and spread the principles of food sovereignty and urban agroecology, putting forward the organization of production and consumption according to the principles of the sustainability and Solidarity Economy. The LEIA achievements include the constitution of an experimental garden at one of the unities of the University, promoting workshops on sustainability. In low income communities, the Laboratory contributes to the implementation of gardens, following the principles of sustainability, Solidarity Economy and Agroecology, through its research and extension actions.

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2.3. UFMG

In the context of Federal University of Minas Gerais, UFMG, parameters are being established for the institutional inclusion of the Gardening Project as a Research and Extension activity. This allows the increase of the number of students and teachers participating in the community gardens movement, involving different areas of study, at the Interdisciplinary Program of Master and Doctoral Degrees of Built Environment and Sustainable Heritage - PACPS, at the Architectural School. Also, the LIDEP - *Laboratório Integrado de Design e Engenharia do Produto* (Design and Product Engineering Integrated Laboratory) from the Department of Industrial Engineering of UFMG, is involved in these projects. LIDEP proposes a multidisciplinary and integrated approach on the Product Project subject, and its members have expertise and experience developing projects focused on product lifecycle, researching on Design for Sustainability, Product Ergonomics, Design Methodology and Computer Aided Design.

Then, as described above, those universities had in their programs and laboratories some common interests related to interdisciplinary practices connected to the promotion of integral sustainability and design, each one with its own particularities. The Community Gardening Project brought them together to develop new ways of working and help communities to achieve their goals.

The general methodology used in the Project was the Participatory Action Research that is constituted by four-moment cycles: collective planning, implementation, monitoring, evaluation of the results and the lessons learned (Franco, 2005; MacDonald, 2012; Tripp, 2005), which was practiced many times during the last years of the Project, in each community. Some of the instruments used were questionnaires, interviews, focus groups, group meetings, observant participation, field diaries, visual records such as photographs and videos.

It is important to highlight the relevance of the adoption of some principles that guide the interventions and are intended to be internalized by the community, in order to create an authentic endogenous local development (Martins et al, 2010; Paula, 2008). The election of a model that features stimulating citizen participation with dialogue, respect to the autonomy and local culture and knowledge, shared decision-making, collective implementation, is as a requirement to reach this local development goals (Cançado, Pereira and Tenório, 2013; Kleba & Wendhausen, 2009; Macke, Carrion & Dilly, 2010), also following the principles of Systemic Design, Agroecology and Solidarity Economy.

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The role of the academic working group within the communities is to allow them to talk about the process of building their gardens, to facilitate the constitution of their own groups, helping them to achieve their own goals, including working together in this construction, orienting them whenever necessary and sometimes providing human and material resources or helping to establish partnerships, such as the ones with the public institutions URBEL and SMASAN, to accomplish the actions planned collectively.

3. THE COMMUNITY GARDENING PROJECT

In this sense, very interesting opportunities are evolving, considering the connection among the communities of four slums in different areas of Belo Horizonte (the third most populated and developed city of Brazil), those three universities and the local administration (URBEL and SMASAN). These experiences aim to overcome some of the local problems applying the theories and methodologies presented above, creating a continuous circular process of the exchange of ideas and practices.

All four ongoing cases that constitute the Gardening Project – *Morro das Pedras, Santa Lúcia, Taquaril and Aglomerado da Serra* - have in common the existence of a vacant area within the community, some residents that see it both as a threat, if left unused, and as an opportunity to make some action for the collectivity. In some cases, there are also opportunities being built to associate with entrepreneurs, generating a new source of income for the community group involved. In turn, public bodies find in popular initiatives, supported by universities, a means to accelerate the achievement of their own objectives.

Although each garden operates on its own, there are increasing exchanges among them in terms of sharing experiences - the difficulties faced, resources, solutions -, and also offering emotional support to each other. On its turn, the academic working group and the public administration are available to listen and support them.

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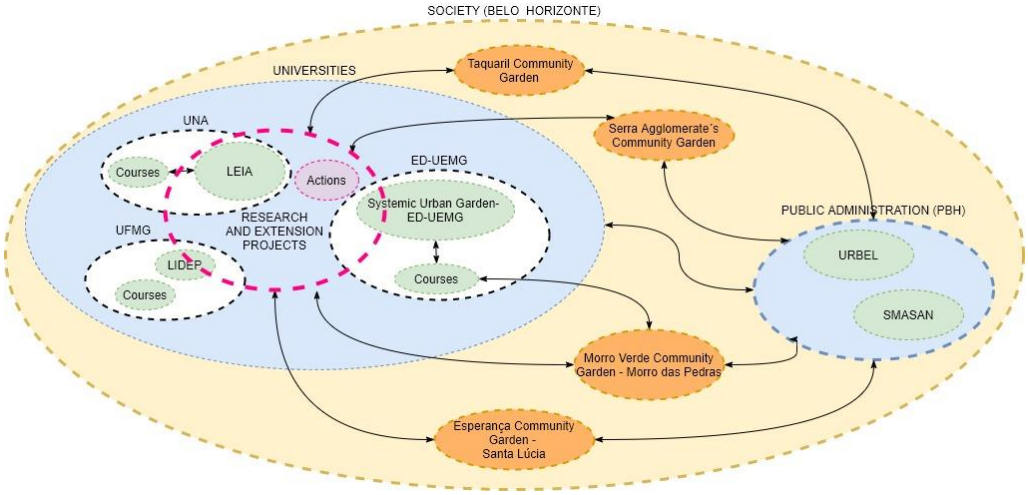

Figure 2. Systemic Representation of the Gardening Project Network

3.1. Morro das Pedras Agglomerate

The first community of the project is the Morro das Pedras Agglomerate, which is a neighbourhood in the western region of the city of Belo Horizonte, formed by seven villages: Antena, Santa Sofia, São Jorge I, II, III, Leonina and Pantanal, in the place where there were originally several farms and a quarry. Today, it is equipped with schools, nursery, public transport, medical and police stations. Nevertheless, the community still has demands for basic sanitation, public lighting and security. Despite all, Morro das Pedras is a place of a significant cultural presence.

A student from the Visual Arts at ED-UEMG, who lives at Vila Antena and is a local leader, has invited us to give a workshop within the community to produce fertilizer from organic waste in order to enrich the soil of an area where there used to be some sheds, removed by local administration because it was beneath a high voltage powerline. In this area, as described by this local leader, they have now a community vegetable garden, where 6 people from the community volunteered to work, donating approximately 2 hours a day during working days and 5 hours on Saturdays to cultivate the garden. Organic waste, some seeds and seedlings are donated by 11 families that participate in the project in exchange for a weekly bag of vegetables that is distributed to the children of the local school that also participate in this movement.

After about a year of development of the vegetable garden along with artistic and cultural activities, the community has won a contest for financial support of the Brazil Foundation organization and this local leader has won a photography contest with an image picturing

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the community. The values of Integral Endeavours have served as guidelines to define activities as well as a style of leadership, community engagement, local education and economic sustainability decisions.

Figure 3. A local fair in Vila Antena, where the community sells its own production (including vegetables) and services (left), and the plot where a new community garden is being built, together with other sustainable activities (right).

The introduction of the Integral Endeavours mindset helps them to look for opportunities that arise from their strengths, connecting initiatives that benefit the community as a whole. For instance, the production from the community garden have participated in a festive fair, where a diversity of actions took place including, beyond market initiatives, yoga lessons and creative hairdressing; and the context of the community garden hosts also a second-hand clothing sale initiative.

3.2. Santa Lúcia Community

The second garden is in the Santa Lúcia Community, also involving an area that has been made vacant by local authorities (URBEL), because of its geological risk. At first, UNA´s LEIA Project team was asked by locals to give support to make a community garden. The academic working group was then constituted by the partnership of UNA, UEMG and UFMG, to support

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the community in this initiative. It was composed as an interdisciplinary effort with the engagement of designers, architects, economists, agronomists, psychologists, sociologists, engineers, gastronomists, nutritionists and nurses, with the support of URBEL and SMASAN, gathering human and material resources.

Consistently to the methodology, the academic working group started by meeting the locals during a few months in order to confirm the community's interest in having a community garden, to identify who would be willing to participate and to understand how they would like to organize the actions to make it a reality. For this, group meetings were undertaken, and an individual survey was carried out. The next months were dedicated to actions such as collective works (*mutirões*) and "Chat and Coffee" meetings, where the latest actions were evaluated, challenges identified, and decisions for next actions taken.

Figure 4: The site where the community garden of Santa Lúcia is being built. On the left, locals harvesting their initial production. On the right, one of our team's agronomist, facilitating the process of levelling the terrain.

Throughout this time, as the garden had already started, a spontaneous management group of five people has emerged, establishing unprecedented interactions in the community, increasing their social cohesion. During events (collective works and meetings), the number of local participants, eventually, reached about 20 persons collaborating in several activities

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(building fences, working in the composting system, cleaning, planting). The spirit of collaboration and the valorisation of networking, the optimization of resources, the respect for nature not using pesticides, are examples of the mindset from the principles of Integral Endeavours, Agroecology and Solidarity Economy, shared by the group of residents, researchers and students.

In this process, it was noticed that the "rhythm" of the academic working group interventions and expectations is usually different from the community´s timing, who is also adopting other forms of organizing itself. The participatory action research cycles showed the need to slow down the interventions and to listen more to the inhabitants, as well as to respect their own ways of acting. For instance, at the beginning of the group action to build the garden, a professor showed how to build flower beds according to the terrain levels following its contour lines and they practiced it together. Nevertheless, in the week after, the inhabitants built the flowerbeds in the way they used to do, applying just a few details of what they had learned. This kind of experience makes the academic working group to be constantly thinking ways to understand their culture and to make the relationship more effective.

At the same time, rich discussions about the principles applied to their vegetable garden, its management and distribution of production are promoted, emphasizing the quality of local production (healthy food, without pesticides) and the importance of conscious consumption. It is noticed that some residents gained in autonomy and voice, because previously they were shy and reluctant to express themselves and now, they are making interventions gradually transforming the space and becoming protagonists within the community.

3.3. Taquaril Community

The third community is in the neighbourhood of Taquaril. In this case, URBEL has invited the academic working group to support some families in the development of their urban gardens, in a preservation area. There, the growth of dense bushes near the residences represented a danger to the families for hiding illicit activities as well as synanthropic animals that are a threat to human health. In this context one of the residents decided to clean the area in front of his house and began cultivating vegetables. He is a retired resident with previous expertise on agriculture and is becoming a reference and inspiration for his neighbours.

In the first contacts the academic working group tried to understand the community needs, and, for that, a focus group was also made with some residents who lived near the area.

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Other meetings happened to exchange knowledge on how to fight pests, to build protection against harsh weather and to make a compost system so that they would have autonomy in producing their own resources to fertilize the soil.

The resident who began this movement is succeeding in developing a very productive space, but the neighbours are not quite engaged yet. This particular process has put into practice another form of sharing the space, where each one is responsible for a piece of the garden as a whole. This situation has also highlighted the importance of creating a network among the various communities in order to stimulate exchanges and participation.

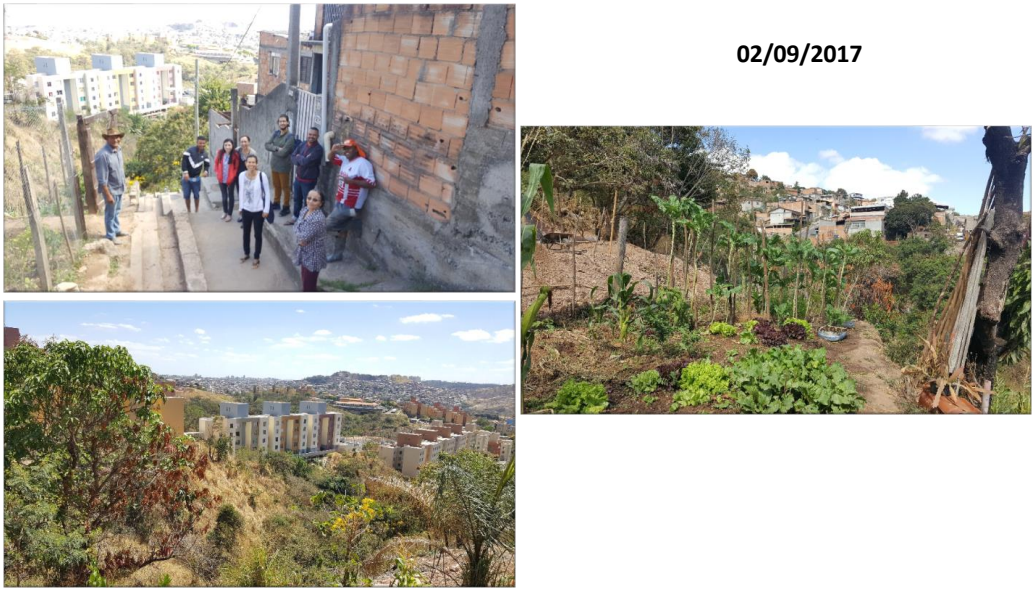

Figure 5: The site of the community garden of Taquaril. On top left, our team and the residents who participate in the initiative.

3.4. Serra´s Agglomerate

In the fourth case, the Serra´s Agglomerate, there is a group that is rather independent, having already a practice of involving the community in selective waste collection, using organic waste to make compost in composting systems with and without earthworms. Some leaders of the community give workshops on this practice and sell boxes for vermiculture. Some academic members of this research group have participated as students in their workshop and afterwards have invited them to take part in a short extension course on vegetable and flower urban gardens that was promoted in the ED-UEMG. Agroecological practices is the main focus of this group, as a way of life, along with healthy eating and income generation.

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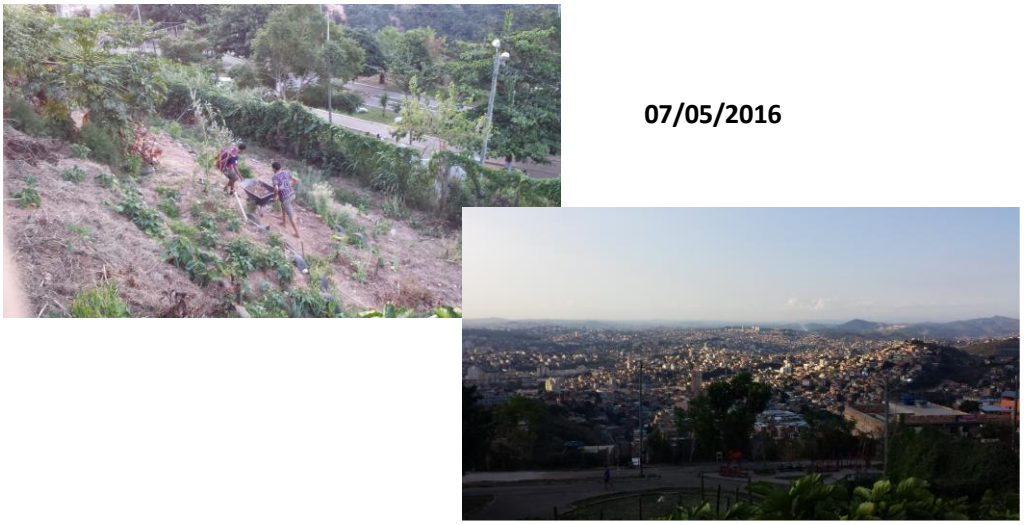

Figure 6: The Serra Agglomerate region and one of the sites where a community garden is being built.

4. CONCLUSION

Much has been discussed on the pursuit for solutions to the problems arising from the accelerated process of urbanization, perceived in England in the nineteenth century, in Brazil from the 1950s on, and nowadays in countries such as China and India. In those situations, the previously existing forms of production collapsed (such as small agricultural production and handicrafts), as well as structures of social relations mainly based on tradition. Among the different problems encountered, access to adequate food, culture and leisure can be mentioned, as well as the loss of the principles of social structuring that aimed at the cohesion and articulation of groups of neighbours in search for common improvements (of which the Brazilian *mutirão* is a good example).

Taking as reference the food issue, the urbanization, the growing inclusion of women in the labour market, the availability of processed foods at low cost and, at the same time, high costs of the healthy food have brought about considerable changes in eating habits and serious public health problems due, for instance, to obesity, affecting also the child and elderly population. In the experiences presented in this article, the problem of food and other social questions such as the lack of cohesion between neighbours are not considered in an isolated way, but in a systemic approach within its social-economic context, including the necessity (or opportunity) of the generation of work and income. It also addresses the question of rampant urbanization involving the occupation of risk areas. This approach to social innovation through Systemic Design is proving to make an important contribution to the development of appropriate solutions for socially complex contexts as seen in large

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Brazilian cities and also demonstrates how design methodologies (such as the Integral Endeavours) can contribute significantly to the solution of human problems.

The mindset created by the methodologies employed allowed to identify within the problem of expropriated areas within the communities, the opportunity of the availability of land to develop initiatives that could benefit the community as a whole, at the same time that would meet the interests of the local public administration of giving to it a safe destination. Community gardens were of interest to the locals and also offered a solution to the problem of environmental degradation and illicit use of idle land in low-income communities.

During this process, difficulties have arisen, such as overcoming individualistic cultures, bringing people together to work collectively and carry out projects of common interest. Availability of few people willing to engage in the project, gossip regarding negative information about the interests of the participants saying that they would be a privileged few chosen by local administration, clash of individual interests were also problems that have arisen. This presented the challenges of managing different interests and conflicts, generating engagement to expand the community character of the initiatives, improving communication among participants and the community as a whole and guaranteeing autonomy to obtain resources necessary to maintain the community gardens.

At the same time, all these processes opened perspectives of helping them to understand and eventually adopt fair trade from surplus production to generate income to contribute to the economic sustainability of the Gardening Project. It was also organized periodic meetings where ideas and experiences could be exchanged to solve common problems without the need of interventions from the academy positioning itself as a knowledge holder. On the contrary, the academic working group is learning from the communities, not only in specific events (such as the workshops taken from the group from Serra´s Agglomerate), but in the whole experience of dealing with each participant of the Project. The respect for their voices and their timing is proving to be essential to achieve the Project's objectives.

The Community Garden initiatives have as the main goal the strengthening of social cohesion within the communities and the widening of their autonomy to be reflected in self-management, broadening of collective identity and health promotion by food sovereignty, strengthening conscious agents, as protagonists of relationships and of their living spaces. Social inclusion, valorisation of diversity, exchange of academic and empirical knowledge are also cornerstones of this Project that is proving to have the potential to promote, progressively, these positive impacts.

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