The search for self-sustainability: The case of Campina community

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ABSTRACT: The stress experienced by most people who live in the big cities of Brazil points to housing solutions that consider the scale of inhabitants per km2 as a major criterion. New forms of housing, which have their projects focused on the well-being of their occupants, must be inserted in housing systems that represent in a rational way people's day by day**.** In this context, the ecological communities' movement represents a new way of man-house-environment integration, with highlights on the search for self-sustainability. The aim of this study is to present the Campina community, an ecological housing structure integrated to a forestry recovery process, installed next to the Chapada Diamantina National Park in Bahia **–** Brazil, since 1991. The development of the community was based in experimentations of organic agriculture techiniques and colective decision processes. The community was formed as a housing project integrating shelters and facilities in a circular organization shape that provides the optimization of internal displacement of its occupants, social interaction and exchange of information. In this work, the community is associated with principles of organization and methods with environmental guidelines, in order to show how to minimize both the impacts of installation and existence of the communities. After the description and analysis of the elements related to the infrastructure construction, rational use of natural resources and self-management procedures, a model was created. This model shows some found solutions to building environmentally adapted housing and a set of practices that are aimed at achieving self-sustainability at various levels.

Keywords *Self-sustainability, environmental recovery, bioconstruction.*

ISBN: 978-85-92631-00-0

1. INTRODUCTION

The world has changed very fast in many aspects after the 19th century industrial revolution. We watched many transformations experienced by most people in all countries, some more than others, but the main process has reached all places, touching communities, families and the general population. In the trail of the technological progress of our civilization, we forgot some aspects of life that now, many years after the great industrial *boom*, have showed how confused we were with our methods in the past.

Today's modern way of life has led us to live in rushed times, ever late and stressed. Of course, there are many different places to live in the world, each with its level of stress, and each with its pleasures and fun. People choose where to live considering many criteria that seem more important. When we make a deep analysis of this question, we can find many situations that are "illusions", created to maintain people captive and tamed**.** As Aldous Huxley predicted, our society would be dominated by the things that we love. In the path of sustainable life, we are discarding all unnecessary stuff and proceedings to get a better energy balance.

Nowadays our social science knows that men and women together compose communities and these groupings have some needs and conditions to remain connected. This is true from small groups to big cities. When we talk about sustainable communities, there are two main concepts to discuss: community and sustainability. In this work these concepts will appear at all times, within their more general acceptance, including a specific case-study on the Campina community experience. Some aspects of the community infrastructure and social design are focused to obtain a simple model of a sustainable community.

1.1 Sustainable communities background

Diegues (2003) points the indigenous communities as the first sustainable human process in our history. This occurred because those primitive people groupings experienced a narrow relationship with the natural elements, understanding their importance in life keeping.

In Batool (2014) the process of sustainable development in communities encompasses natural resources management, social division services and infrastructure. This can be found in many modern and ancient communities around the world. This approach may look very simple, but Dahir et al (2009) points to the holistic aspects of the sustainable development with many different experts working in almost all disciplines, to cover the main questions involving sustainable environmental situations.

Desired sustainable characteristics, such as minimizing natural resources depletion, use of local accrued profits, production of alternative energy and equitable distribution of riches are important ways to go toward sustainable communities (Kitchen and Mardsen, 2011). This is a part of self-sustainable efforts that could be useful, if our culture were not fixed in consumption without limits. To fix this problem, Davies (2002) exalts the importance of the partnership between all actors of the sustainable local planning. It is a real and objective way to improve, because it implies the sum of features, expanding the isolated capacities.

ISBN: 978-85-92631-00-0

Toward the natural life in communities, Botta (2015) brought into the discussion the concept of slow life, which is a good way to avoid stressful situations, giving a better level of satisfaction in many different environments. In a modern point of view of sustainable communities, English (2015) presents the natural destination of all communities to becoming a learning center, with a focus on community-based education for sustainable development. The Campina community is an example of a learning center formed on twenty five years of studies and practices of self-sustainable techniques.

1.2 Methodological Considerations

The main line of action adopted by the community's initial group was a basic study about the some knowledge areas and the performing of many experiments. We assumed that all knowledge should be tested and adapted to local conditions. The focus was how to live a simple life, outside the big cities and far from the "consumist system" requirements. This directive implies in a set of self-sustainable principles and organic agriculture techiniques to be followed by the strategic planning of the community.

All parts of the community, described bellow, were developed and adopted after some time of test. But the community is not like a common laboratory, where we can see isolated experiments. There are permanent interations between all components of the community**.** Moreover, after the 2000's, the initial knowledge was changed to integrated design of Permaculture, to get closer the main objectives of the community.

2. CAMPINA COMMUNITY: A PLACE IN AN ENVIRONMENTAL RECOVERY PROCESS

The location of the Campina community (Fig. 1) is one of the most beautiful places in Brazil. Chapada Diamantina is a big region of the Bahia state, in northeastern Brazil. The region was formed by the tectonic movement of very ancient stones, and that is the major cause for diamonds occurring, in the past century.

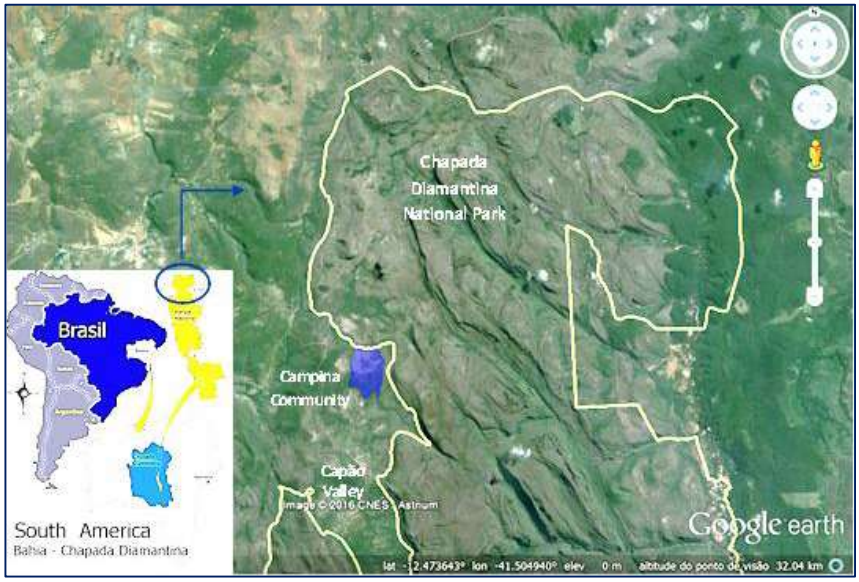

Figure 1: The Campina community location related to the Chapada Diamantina National Park. Image: Google earth and SAM (2016).

ISBN: 978-85-92631-00-0

During the period of 1987-1988, a small group of people came to live in the Capão Valley, almost inside the Chapada Diamantina National Park. These people quickly met in joint efforts to work, sing, have fun and discuss aspects of spirituality and ecology, making a logistic structure that has provided good and effective results of the collective work. So, in 1991 the community land was purchased by one of these people, and the group was invited to live in this space and to create the community.

In 1991, the community land and soil were very degraded, by many decades of extensive crops of coffee, draining most part of the rich soil of the original forests. After that, the coffee disappeared, but native people used many animals to work and they needed large areas for pasture. That meant burning the fields two or three times per year. The biodiversity was very poor and there was a thin layer of organic soil, with some dominant plants that have provided an amount of organic matter. The kitchen area had no trees (Fig. 2 left) and all of the trees that are in this area today were planted, irrigated and protected to make the current environment (Fig. 2 right) of the kitchen.

Figure 2: The same point of view of the Campina's kitchen, in 1991 (left) and 2016 (right). Photos: Campina collection (left), Helder Munay (right).

Having “received” a piece of hard degraded land, the main objective of the Campina community was established as to promote the environmental recovery of the land space, considering: the application of less impacting engineering; adoption of natural feeding and style; decision making by consensus; development of a new economic system; and to live according to “the spiritual purpose of life”**.** The first agreements were created based on common sense, with a continuous development process. The set of tasks was distributed among people observing individual skills, making use of collective dedication to the heavy jobs.

After some time we understood that there was a set of resources needed, such as water, soil, organic matter, food, energy and tools, that we should have, in a reasonable level of self-sustainability.

The solutions were represented by: water harvesting in the mountain; use of the richer soil, that was near to the river, to utilize some amount of sediment deposits; organic matter production was made with extensive use of tall grass species, with large production of leaves; buying or exchanging food items in wholesale; developing solar and wind energy systems; building and keeping a work place and organization for tools.

ISBN: 978-85-92631-00-0

The number of people living in Campina was been dynamic, varying from fifteen to thirty-five. Nowadays, there are seven residents, seven candidates to resident, five visitors and three children.

3. THE MANDALA LIVING MODEL

The main structure of living in the Campina community is the mandala model system, with community buildings placed around the kitchen. This idea was created by living observations in Capão Valley. Before the Campina creation, people who founded the community observed that the main movements in all places of the Capão were located around the kitchens of the local houses. People use kitchens not only for food, but many other situations that require the grouping of people. This is especially observed if we consider the cold climate of the region and the use of wood stoves to cook food. It is very pleasant to eat with friends around the wood burning stove and this process has been used in the Campina community in the last 25 years.

The mandala model (Fig. 3) is very simple in its construction, but very efficient in day by day situations (Venugopal, 2012). This structure causes economy of energy, because it is not necessary to have big displacements for most people. All jobs are located around the kitchen, resulting in the gain of time by avoiding unnecessary moves. It is also efficient to make the tasks simpler and easier to do. Furthermore, workers come to the kitchen early in the morning and go home after lunch, when the community work period ends.

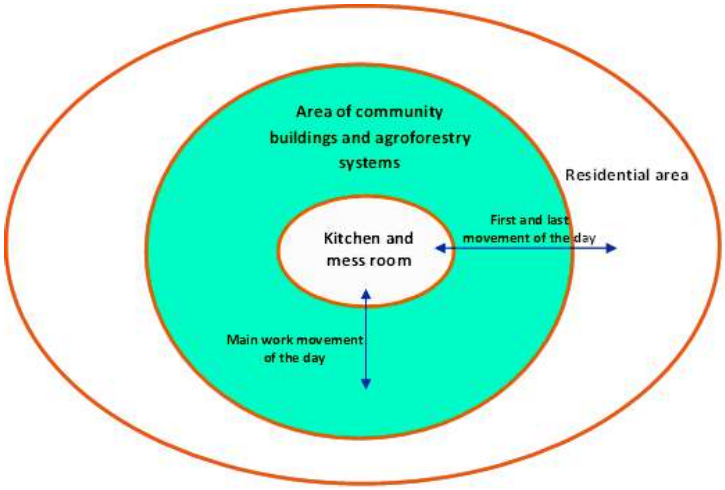

Figure 3: Main structure of central kitchen, community constructions, agroforestry systems and residential area in Campina community.

Inside the mandala model, around the kitchen, the Campina community infrastructure has a workplace office, kitchen garden, children´s school, compost area, visitors' lodging and camping, firewood cutting and storing place, herbarium and natural cosmetics small factory, agroforestry systems and a social restroom. These components are integrated in a simple way of life that uses natural resources with a minimal impact in the environment, helping the recovery of the regional flora and wildlife. This structure helps to maintain a closed life-cycle in the use of natural resources, taking advantage of all Campina's residues, in an integrated fertilization process.

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An important part of the sustainable structure of the community is its waste treatment system. Seadon (2010) says that a well-planned waste system can increase the energy balance in any place. Campina community has experienced many forms to get a solution for the human waste in the past 25 years. Nowadays, the community uses evapotranspiration septic tanks (Paulo et al, 2013) in residential buildings and a rotating restroom (Fig. 4) to avail human waste in fruit crops.

Figure 4: Social restroom with human waste utilization on fruit trees fertilization. Photo: Helder Munai.

The main idea of using "circle" structures makes the difference. For example, in the Campina kitchen, a firewood stove is used for cooking (Carvalho et al, 2013). There are many advantages to this, because the region is cold and the stove generates an amount of desired heat in the kitchen. At the same time, the stove has an oven attached for baking. Also, the stove has a fruit dryer and a water heater. The wood supply is in continuous growth because the forests are preserved. So, the community is almost self-sustainable in renewable energy consumption.

4. SOCIAL ORGANIZATION

The social organization of the group that lives in the community is based on the stratification of the responsibilities face to the tasks, activities and decisions, day by day. A person who wants to live in the community begins the candidate process being a "visitor". A visitor is a person who is in the initial stage and at this time, he needs to observe and follow the orientation of the "residents".

As visitors, people in Campina are oriented to work in many different jobs, to understand at least the general way to work. This period is completed in 30 days, divided in three sections of ten days, when the visitors are evaluated by all the people in the community. If the visitor is well evaluated after the first thirty days, then he can be considered a "residential candidate".

ISBN: 978-85-92631-00-0

As a residential candidate, people in Campina must be engaged in some of the grouping tasks called "focalizations". Nowadays the community has 25 focalizations that work only in the morning, which is the community period of the day. After lunch (12:30 PM) community time is free and used to remain at home, walk to some tourist places, read, enjoy friendships and so on.

After one year as a residential candidate, if approved by the community, the candidate is promoted to a resident. Then, his responsibilities are greatly increased, having a place and vote in the main decisions of the community. If a resident moves away from the community for more than one year, a new six month period of re-adaptation is required. This system has had good results in the last 20 years.

5. BUILDING A SUSTAINABLE COMMUNITY MODEL

A model for sustainable community could begin with the definition of a command system, i.e. how decisions are taken. In the Campina community, the main process for decision making is consensus. A hard decision is taken in discussion for many days and many meetings. When a decision is finally required, the minor group of stakeholders gives up of their position, in benefit of the community consensus. This is a good way and works well for most of cases.

The second component of sustainable community is the food. For this resource, a good decision is to eliminate sophisticated needs. Using local production and buying foods that not are produced by the community directly from local producers. It is very interesting to produce our own food, but that needs good soil, seeds, irrigation and much effort. Also, obtaining food is a continuous process and sometimes the level of self-sustainability is high, sometimes is low, but we know that is too important to have a good demand management system.

Not less important, in the search for sustainability, is to have security. People need security to be happy, it is clear and logical. In general, communities have distinct situations for keeping secure. This is the component which is very dependent of the group union, because it is easier to have power and robustness if the people are together. Legal support is necessary to face some problems that involve other actors outside the community, as well as people who live inside the community.

Friendship, fraternity, availability and collaborative skills are desired in a community life. This is the beauty of the community and makes life good. Improving alternative energy systems, recycling water and waste can be obtained in simple engineering solutions. Extensive use of bikes and sharing vehicles have a low environmental impact and makes the transport system more human. Holistic spiritual doctrines are also indicated to aggregate people around similar life principles and bring the group together.

6. CONCLUSIONS

The main conclusion is that the sustainable community process is a long process. Since 1991 the Campina residents and visitor groups have been working, protecting, dancing, singing, and caring for a small piece of land, with dedication, happiness, sweat and tears. This work aimed to show the main aspects of the Campina community, in its search for

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self-sustainability. But, the knowledge inside the Campina experience is that the community is formed by people, and modern people are made up of a very complex set of emotions, desires, expectations, passions, happiness and sadness.

Because the community is strongly dependent on the people, it is not a linear process, with well-defined solutions. Each case is one case. In this work, we tried to show some ecological aspects that were used to build the "Campina's way of life." These aspects were discovered, based on theoretical materials, such as books and rural magazines, but they had a big experimentation field in the degraded land of Capão Valley, in Chapada Diamantina, Brazil. Many people contributed to the community, in these past 25 years. Of course, the community is a collective construction.

The environmental recovery process is our way for whole life, not only to the community, but as a current directive to be used in this degraded world. The Campina community is part of this post-carbon age, with simplicity and happiness.

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